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FOR EDITORIAL AND BUSINESS NOTICES, SEE THIRD COVER PAGE

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BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

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THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief
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Vol. 13

APRIL, 1924
ENTRIES 2134-3228

No. 4

AGRONOMY

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MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 2281, 2430, 2506, 2509, 2539, 2551, 2585, 2589, 2798, 2840, 2934, 2935, 3011, 3133, 3137)

2134. ANONYMOUS. A machine for extracting *Hibiscus* or jute fibre. An invention that may revolutionise the industry. South African Jour. Indust. 6: 250-253. 5 fig. 1923.—This machine separates the fiber of *Hibiscus cannabinus* after retting. It is claimed that it can do the work of 20 natives, besides insuring wool of the utmost cleanliness. The inventor intends to organize the industry and to establish mills for spinning and weaving the material into the various products, principally grain bags, for which a large demand exists in South Africa.—L. J. Goldblatt.

2135. ANONYMOUS. Field experiments, 1922. Jour. Dept. Agric. Ireland 23: 345-359. 1923.—Reference is made to tests with phosphatic manures on meadow hay, turnips, mangels, potatoes, and pasture; to variety tests of barley, potatoes, mangels, oats, turnips, and wheat; to a manurial test with potatoes on peaty soil; and to a spring application of nitrogenous manure to autumn-sown wheat. Copper sulphate spraying of oats infested with charlock was profitable.—Donald Folsom.

2136. ANONYMOUS. L'exploitation des peuplements d'halfa en Algérie et au Maroc. [Exploitation of halfa in Algeria and Morocco.] Rev. Bot. Appl. et Agric. Coloniale 2: 284-285. 1922.—Observations made by General Lévê and others, at a recent conference on Algerian affairs, tend to show that halfa (*Stipa tenacissima* L.) is in danger of extermination in Algeria because of reckless exploitation. Halfa is not only a valuable commercial source of cellulose in Algeria, but is also an excellent forage plant. However, L. Trabut, director of the Service Botanique of Algeria, states that unless the plants are pulled up before they are mature, enough of the rhizome remains to start a new plant.—Paul Russell.

2137. ANONYMOUS. New wheat trials. Queensland Agric. Jour. 19: 436. 1923.—A summary is given of results for the season 1922 of wheat breeding and selection by the Department of Agriculture and Stock of Queensland.—W. D. Francis.

2138. ANONYMOUS. Report of the work of the seed propagation division for 1922. Jour. Dept. Agric. Ireland 23: 78-97. 1923.—Reference is made to pure line cultivations and hybrids and large and small scale variety tests of wheat, oats, barley, flax, and grasses.—Donald Folsom.

2139. ANONYMOUS. The production of red wheats. *Agric. Gaz. New South Wales* 34: 712. 1923.—At a Commonwealth Conference recently held, future production of red wheat in Australia was officially discouraged because of the injurious effect of such wheats upon the white Australian wheat, at present recognized as the standard in the world's markets.—*L. R. Waldron.*

2140. ANONYMOUS. The value of animal manure. *Agric. Gaz. New South Wales* 34: 696. 1923.—A plat sown to oats and peas for fodder, fertilized with mineral manures fortified with an application of cowyard manure, outyielded a check plat similarly sown and fertilized with mineral manures only, by over 40 per cent. It was estimated that the use of the manure gave an increased return per acre of over £ 4.—*L. R. Waldron.*

2141. BEVAN, W. Flax in Cyprus. *Cyprus Agric. Jour.* 18: 104-107. 1923.—A general discussion of flax culture is given. At present flax is being grown chiefly in the Messaorian plain. Nearer Famagusta the grain is the main object of culture, the stalk being frequently discarded, while near Morphou-Zeropotamus the fiber is highly valued. An expert in flax culture has been engaged by the Agricultural Department of Cyprus.—*W. Stuart.*

2142. BLACKSHAW, G. N. Chemical composition of white and yellow maize. *Rhodesia Agric. Jour.* 20: 457-460. 1923.—Analysis shows that there is no difference in the nutritive value of white and yellow maize, and though a certain strain or variety of one may be superior to any particular strain or variety of the other in a given locality there is no uniform difference in productiveness or feeding properties.—*L. J. Goldblatt.*

2143. BLACKSHAW, G. N. White vs. yellow maize. *Rhodesia Agric. Jour.* 20: 178-182. 1923.—The author discusses the relative merits of white and yellow maize from the growers' and feeders' points of view. He maintains that the yellow grains are not rich in vitamin A and that the evidence so far adduced in favor of yellow seeded varieties as regards vitamin A content is not very conclusive.—*L. J. Goldblatt.*

2144. BLAKELY, W. F. Weeds of New South Wales. *Agric. Gaz. New South Wales* 34: 743-745. 1 fig. 1923.—*Sisymbrium Sophia* (flixweed) is described and suggestions are given for its control and eradication.—*L. R. Waldron.*

2145. BOVING, P. A. The valuation of farm crops. An attempt to demonstrate the usefulness of a unit system for this purpose. *Sci. Agric.* 4: 66-70. 1923.—The writer shows the importance of the use of a unit system of estimating the values of the various farm crops as feed for dairy cattle. He strongly recommends the "Scandinavian Feed Unit System," and applies it to an average 100-acre farm raising grain, clover, hay, and hoed crops.—*T. G. Major.*

2146. CHEVALIER, A. Améliorations agricoles dans les colonies françaises. Les transports agricoles et les projets d'irrigation dans la Haute-Volta. [Agricultural improvements in the French colonies. Agricultural transportation and irrigation projects in Haute-Volta.] *Rev. Bot. Appl. et Agric. Coloniale* 2: 281-282. 1922.—Agricultural conditions in Haute-Volta, a colony established by a decree issued in 1919 and consisting of a portion of the territory of Boto-Dioulasso, French Sudan, are discussed.—*Paul Russell.*

2147. CHEVALIER, A. Un fourrage exotique peu connu: Le kudzu. [A little known exotic forage: kudzu.] *Rev. Bot. Appl. et Agric. Coloniale* 2: 279-281. 1922.—A brief summary is given of the status of *Pueraria thunbergiana* Benth. throughout the world. Investigation is recommended for 3 other species, *P. Thomsoni* Benth., *P. tonkinensis* Gagnepain, and *P. edulis* Pampanini, all native to eastern Asia, and all having edible tuberous roots.—*Paul Russell.*

2148. CHRISTENSEN, C. J. Forskellige Gødningsforsøg paa Mosegord. [Experiments with different fertilizers on heather and reclaimed swamp soil.] [Beretning fra Statens Forsøgsvirksomhed i Plantekultur 167, as reported in] *Tidsskr. Planteavl* 20: 462-509. 1923.—Denmark's great heather and swamp area has long been considered of little agricultural value. For the past 50 years government investigators have performed experiments the results of which have made large areas in the heather sections of agricultural value. The kinds of fertilizers used and other details are given.—*Albert A. Hansen.*

2149. CLAYTON, E. S. Clarence River maize-growing contest. Season 1922-23. *Agric. Gaz. New South Wales* 34: 713-716. 1923.—A total of 17 entries of 8 varieties of maize competed for prizes, the crop being grown at 2 points. Yellow horsetooth averaged over 100 bushels per acre.—*L. R. Waldron.*

2150. COX, J. F. *The cut-over lands in relation to agricultural use.* Rept. Michigan Acad. Sci. 22: 21-24. 1920.—The cut-over lands of northern Michigan, said to be one of the few remaining great reserves of agricultural land, are characterized by marked extremes in soil type, closely intermingled. Lack of authoritative information as to the exact distribution and capabilities of the different types has greatly retarded development of the region. The poor soils, which somewhat exceed the good soils in area, are termed unsuited for farming under present conditions. The good soils produce profitably June grass, alsike clover, rye, barley, oats, spring wheat, root crops, peas and oats, buckwheat, and to some extent winter wheat and corn. Potatoes are particularly suited. A state survey properly to designate the value of land for farming, grazing and forestry purposes, and adequate fire control are thought necessary.—*L. W. Kephart.*

2151. CROWTHER, CHAS. *Science and the agricultural crisis.* Nature 112: 510-513. 1923.—The complexity of the soil problem is briefly discussed.—*O. A. Stevens.*

2152. DOWNIE, J. W. *Rhodesian products in Europe.* Rhodesia Agric. Jour. 19: 713-717. 1922.—The writer discusses the prospects of certain products in European markets. There is a big demand in Europe for maize, ground nuts, and sunflower seed, but a limited market for maize meal and beans.—*L. J. Goldblatt.*

2153. DOWNING, R. G. *Top-dressing of lucerne with superphosphate.* Field experiments at Yanco experiment farm. Agric. Gaz. New South Wales 34: 731-732. 1923.—Top-dressing alfalfa at the rate of 200 pounds of superphosphate per acre has resulted in an average increased yield for 4 years of approximately 1.5 tons per acre per year. Deducting cost of fertilizer and its application from gross returns, the net increased return has been over £8 per acre. Only on rich alluvial soils has top-dressing alfalfa given negative results.—*L. R. Waldron.*

2154. EASTERBY, H. T. *A summary of some experiments carried out by the Bureau of Sugar Experiment Stations, VI.* Queensland Agric. Jour. 19: 76-78. 1923.—It is concluded that the yield from sugar cane where arrowed cane was used for planting gave a higher yield than where the plants were cut from non-arrowed cane.—*W. D. Francis.*

2155. EASTERBY, H. T. *Notes on the Queensland sugar industry.* Queensland Agric. Jour. 19: 200-206. Pl. 45. 1923.—A brief general history of the industry in Queensland is given and a short account of the 2 chief varieties of cane cultivated, of the soils, weather conditions etc., in the sugar districts.—*W. D. Francis.*

2156. ELLIS, V. S., AND R. D. WILLIAMS. *Growing red clover seed in Wales.* Jour. Ministry Agric. Great Britain 30: 533-535. 1923.—For many generations the Vale of Clwyd and the eastern portion of Montgomeryshire have been famous for their red clover. The clovers from both sections are late-flowering types which are noticeably persistent for 3 and even 4 years. Experiments at the Wales Plant Breeding Station, Aberystwyth, indicate their marked superiority over foreign clovers for long-term grasslands. Recently the growers in each district have organized a Seed Grower's Association to promote the inspection and certification of seed of these strains.—*L. W. Kephart.*

2157. ERIKSSON, G. *Några undersökningar över svenska rödklöverstammar.* [Investigations of Swedish strains of *Trifolium pratense*.] Nordisk Jordbrugsforskning 1922: 213-227. 1922.—The hay percentage (weight of hay in proportion to green weight) of clover is high in dry, and low in moist seasons, but aside from that it is a special character. The relation between the yields of 1st and 2nd years is an independent character and has a high value in the late (clay) types. The color factors of the seed are classified in 4 groups: anthocyan, chlorophyll in seed coat, epidermis structure incrustations, and other cell sap colors. Other independent characters are bushing, branching, and height. In the formation of local strains the ecological factors have been important and the author segregates a light soil group, a clay group, and a remontant group.—*Ernst Gram.*

2158. EYLES, F. *Statistics of crops grown by Europeans in Southern Rhodesia.* Rhodesia Agric. Jour. 20: 10-22. 1923.—Yields of the various crops from the different districts are fully tabulated. Though maize is Rhodesia's main crop it is not the mainstay of the majority of Rhodesian farmers. Apparently over 80 per cent rely upon other means for a livelihood.—*L. J. Goldblatt.*

2159. GASSER, G. W. Report of work at Fairbanks station. Ann. Rept. Alaska Agric. Exp. Sta. 1921: 23-32. Pl. 7. 1923.—Trials are reported with 13 varieties of oats, 17 of barley, and 3 of wheat, as well as with alfalfa and buckwheat. Some of the grains were the result of the author's plant breeding work at Rampert. Complete fertilizer at the rate of 400 pounds per acre used on potatoes showed a profit of \$53.80 per acre. Turnips, rutabagas, and sugar beets were grown for feed, and a few garden vegetables were grown. Strawberries did not do well, exotic raspberries froze back, and several annual flowers were grown. Crop statistics for the Tanana Valley are given. Soybeans made slow growth and produced no buds while tobacco was fairly thrifty and formed buds but no flowers.—*J. P. Anderson.*

2160. GEILMANN. Der Eschboden und seine Düngerbedürftigkeit. ["Eschboden" and its fertilizer requirements.] Jour. Landw. 71: 53-115. 1923.—"Eschboden" or "Esch" is the name commonly applied to the heavy, sandy, humous soil of western Hanover. The soil is relatively poor in the elements of plant food, but shows a large capacity for retaining NH_3 , KCl, and phosphorus acid. The soil shows acid properties and power to decompose neutral salts. Lime, nitrogen, potash, and phosphoric acid should be added each year.—*F. M. Schertz.*

2161. GEORGESON, C. C. Summary of work at the stations. Ann. Rept. Alaska Agric. Exp. Sta. 1921: 1-7. 1923.—A brief summary is given of work at each of the 5 experiment stations in Alaska, reported in more detail in the reports of the several stations (see Bot. Absts 13, Entries 1697, 2159, 2164, 2190, 2208.) On pages 47-49 are given letters from settlers on the seeds and plants distributed by the stations.—*J. P. Anderson.*

2162. GIROLA, CARLOS D. Cultivo del mani (cacahuete) (*Arachis hypogaea* L.) en la República Argentina. [Peanut culture in Argentina.] 108 p., illus. Gadola: Buenos Aires, 1921.—The peanut is cultivated in Argentina fairly extensively in the provinces of Sante Fe and Entre Rios with smaller plantings in other sub-tropical provinces. The area planted in 1918 in Argentina was 30,000 hectares. Statistics of production for other peanut growing countries are included for comparison. A botanical description of the plant is given, *Arachis africana* and *A. asiatica* being considered as varieties only. A considerable series of varieties has been grown and studied under Argentinian conditions. A system of classification for the varieties tested is outlined, based on the following distinguishing characters: the uses to which the nuts are put (food or manufacturing purposes), erect or decumbent stemmed plants, and the color of the skin or pellicle (red or brown). Following the key a brief description is given of each variety with notes on the more important foreign varieties. Cultural directions under Argentinian conditions are considered at length as are also the manufacture of peanut production and the chemical composition of the pods, nuts, and other plant parts.—*John A. Stevenson.*

2163. GUILLAUMIN, A. Les variétés de Soya d'Extrême-Orient. [Soy bean varieties from the Far East.] Rev. Bot. Appl. et Agric. Coloniale 2: 254-258. 1922.—Since very ancient times the soybean (*Glycine soja* Sieb & Zucc.; *Soja hispida* Moench. [*Soja max* (L.) Piper]) has been grown in the Far East; it is mentioned by Houandi, in the Shénon, about 3,000 or 3,500 B. C. From this region the cultivation of the soybean has spread throughout the world and hundreds of varieties, suited to local needs and conditions, have been evolved.—*Paul Russell.*

2164. HAHN, C. S. Report of work at Rampert station. Ann. Rept. Alaska Agric. Exp. Sta. 1921: 33-44. Pl. 8-9. 1923.—Reports on peas, alfalfa, vetch (*Vicia cracca*), *Trifolium lupinaster*, rye, and spring grains are presented. Many varieties of wheat, oats, and barley were grown, most of which were hybrids originated at the station. Hemp, flax, strawberries, and raspberries were grown with only fair success as well as potatoes, hardy vegetables, and some flowers. Drought did some damage.—*J. P. Anderson.*

2165. HANSEN, K. Planteavlén 1922. [The 1922 harvest.] Tidsskr. Landokonomi 9: 393-421. 1923.—The acreage of small grains, potatoes, beets, carrots, and turnips was increased while the amount of hay planted was decreased. Statistics on yield per acre, total yields, etc., for staple crops in Denmark are given.—*Albert A. Hansen.*

2166. HOFER, ALEX. Zur Hebung der Roggenerträge. [On increasing the yield of rye.] Wiener. Landw. Zeitg. 73: 250. 1923.—A high yielding strain of rye can be maintained only by head selection of seed in the field. This is due to cross-pollination from inferior stocks in neigh-

boring fields. A mediocre stock can often be improved by selection of high yielding heads; as much as 80 per cent increase in yielding capacity has been attained in this way.—*F. Weiss.*

2167. JENNINGS, A. C. Summer irrigation in Rhodesia. Rhodesia Agric. Jour. 19: 683-686. 1923.—In Rhodesia are large areas with insufficient rainfall or with unsatisfactory distribution of rainfall. Much of this country, partly settled, and hundreds of thousands of acres of untouched low-lying land could be irrigated by conserving the water of rivers which traverse these areas, rising in country of higher elevation and greater rainfall and thus receiving enormous volumes of water during the summer season.—*L. J. Goldblatt.*

2168. KEANE, J. Crop and fallow competitions, Minyip, 1921. Jour. Dept. Agric. Victoria 20: 26-34. *IBID.* Crop and fallow competitions, Kaniva, 1921. *IBID.* 20: 72-79. *IBID.* Crop and fallow competitions, Beulah March, 1922. *IBID.* 20: 216-218. 1922. H. A. MULLETT. Beulah crop and fallow competitions, 1921. *IBID.* 20: 65-71. *IBID.* Crop and fallow competitions. Warracknabeal, 1921. *IBID.* 20: 136-146. *IBID.* Crop and fallow competitions, Donald, 1921, *IBID.* 20: 302-309. 1922. T. M. TULLOH. Dimboola crop and fallow competitions. *IBID.* 20: 205-215. *IBID.* Goroce crop and fallow competitions. 1921. *IBID.* 20: 295-301. 1922.—Competitions were carried on in 7 districts in Victoria as follows: wheat was the only crop entered in the competition and Federation the most popular variety, although Penny was grown quite extensively, which variety has proved resistant to red rust. Other varieties grown were Dollar and Dart's Imperial. The character of the soil in the various districts shows wide variation and the methods of handling the soil and crop to get the best results vary considerably. In general, however, the competitions have brought out the advantages of summer fallow followed by frequent cultivations to keep down the weed growth; late seeding, generally from middle of June to early July, heavier rates of seeding than had been previously practiced and liberal applications of fertilizer. The most satisfactory rate of sowing ranges from 70 to 100 pounds and in general applications of about 100 pounds of superphosphate per acre seem to give the best results. The so called "Mallee" soils should not be worked deeply or persistently while dry, as this increases the danger of damage from "take-all." When sandy, fallow lands should be left in the rough to avoid drifting.—*H. L. Westover.*

2169. KELLER, G. N. Tobacco growing in Ireland. Jour. Dept. Agric. Ireland 23: 15-19. 1923.—Conditions of growing, rehandling, and marketing are described.—*Donald Folsom.*

2170. KERLE, W. D. Farmers' experiment plots. Potato experiments, 1922-23. Central-western district. Agric. Gaz. New South Wales 34: 733-736. 1923.—A maximum of 15 varieties are under trial at 4 points. Because of extreme drought very low yields were secured.—*L. R. Waldron.*

2171. KNUDSEN, EJNAR. Forsøg med Kunstgødning til Graes paa Faerøerne. [Experiments with fertilizers on grass on the Faroe Islands.] [Beretning fra Statens Forsøgsvirksomhed i Plankteknatur No. 163 as reported in] Tidsskr. Planteavl 29: 310-320. Fig. 3. 1923.—The topography is mountainous with numerous fertile valleys. Sheep raising is one of the principal industries. The results of 1921-1922 experiments with fertilizers to increase grass production are here reported. Experimental work on turnips and other root crops are in progress.—*Albert A. Hansen.*

2172. KWISDA, W. Merkblatt zur Ackerbietkultur. [Note on garden bed culture.] Wiener Landw. Zeitg. 73: 249-250. 1923.—This is a description of a method of growing small grains under cultivation. Examples are given of favorable results from its use, particularly in the case of winter grains which are sometimes exposed to severe drouth in the spring. By transplanting and hilling the soil about the haulm many tillers are formed. The use of seed bands is particularly adapted to this method of culture.—*F. Weiss.*

2173. LINDEMUTH. Beitrag zur Biologie von *Vicia hirsuta* Koch. und ihre Bedeutung als landwirtschaftliches Unkraut. [A biological study of *Vicia hirsuta* Koch. and its significance as a weed.] Mitteil. Deutsch. Landw. Ges. 38: 502-505. 1923.—*Vicia hirsuta* is described as a weed in the grain fields of northern Germany. Several other species of *Vicia* which occur in this region are compared with *V. hirsuta* and the distinguishing characteristics pointed out. Introduction, distribution, and method of control are discussed.—*Roland McKee.*

2174. LYDE, L. W. The Imperial Conference and natural resources. Nature 112: 493-494. 1923.—Reference is made to crop, timber, and meat resources. A rough survey has

already shown that the British Empire can supply all that it needs in wheat, oats, maize, rice, tea, coffee, cocoa, sugar, oilseeds, wool, rubber, jute, sisal, the most important constructional timber, and most of the barley and half of the cotton.—O. A. Stevens.

2175. M. Kieselsäure als Phosphorsäureersatz. [Silicic acid a substitute for phosphoric acid.] Wiener Landw. Zeitg. 73: 242. 1923.—This presents the theory of Pfeiffer [see Bot. Absts. 12, Entry 4745] that the increase of yield produced by the application of silicic acid fertilizers to soils poor in phosphorous is due to partial replacement of phosphorous in inorganic compounds in the vegetative parts, rendering it available for organic combination in the seed. The yield of straw declined in proportion as that of the grain increased with silicic acid fertilizer.—F. Weiss.

2176. McLoughlin, D. E. Winter cereal experiments, season 1921. Rhodesia Agric. Jour. 19: 593-595. 1922.—Experiments by individual farmers show the remarkable possibilities of damp vleis soils of Rhodesia for growing cereal crops, especially wheat, in winter after a normal rainy season.—L. J. Goldblatt.

2177. MAINWARING, C. Hay making in Rhodesia. Rhodesia Agric. Jour. 20: 409-411. 4 fig. 1923.—Given fine weather, hay making is a simple process in Rhodesia. The suitability of certain grasses as teff, Sudan, the native rooi and several species of native perennial hay grasses as *Setaria*, commonly known as Rhodesian timothy, and a few species of *Panicum* are discussed, as well as a number of introduced legumes as kafir, velvet and *Dolichos* beans and beggar weed.—L. J. Goldblatt.

2178. MAINWARING, C. Seed supply in Rhodesia. Rhodesia Agric. Jour. 19: 548-550. 1922.—The present source of seed supply is such as to cause grave apprehension. Analysis of 27 varieties of oats, sold for seed from extra Rhodesian sources, showed that only 6 could be classed as seed suitable for securing a clean, satisfactory crop.—L. J. Goldblatt.

2179. MAINWARING, C. The growing of potatoes in southern Rhodesia. Rhodesia Agric. Jour. 20: 173-177. 3 fig. 1923.—Owing to the very small export trade potatoes are never likely to be grown on so extensive a scale in Rhodesia as are maize, tobacco, or wheat.—L. J. Goldblatt.

2180. MILLIGAN, S. Review of agricultural operations in India, 1921-22. 160 p., 4 pl. Government Press; Calcutta, 1923.—The results achieved by the Imperial and Provincial Agricultural Departments for 1921-22 are summarized as follows: agricultural conditions for the year; areas under cultivation, economic work (development of superior varieties, distribution of seed, diseases, etc.) on wheat, sugarcane, cotton, jute and other fiber plants, indigo, tobacco, oil seeds (flax, sesamum, castor, groundnut, and coconut), tea, coffee, rubber, fruit, fodder crops and grasses, *Andropogon sorghum*, *Eleusine coracana*, potatoes, and legumes; investigations on soils (surveys, soil gases, moisture, reclamation of saline lands, and movements of nitrates), nitrogen fixation, manures and fertilizers, sugarcane, preparation of malt from sorghum, lathyrism, and diseases of crops; the work of seed and demonstration farms, co-operative societies, agricultural associations, court of wards estates, and district boards, in the distribution of better seeds, implements and manures, and in securing fair prices for produce; the work of agricultural colleges, schools, and short courses in the various provinces; the co-operative movement as it affects agriculture; a report on live stock including cattle and sheep breeding. Appendices give for the year 1921-22: areas under new and improved varieties of crops; a list of agricultural stations in British India; operations of non-credit agricultural co-operative societies; and a list of 204 agricultural publications in India, about 150 of which deal with subjects of botanical interest.—Winfield Dudgeon.

2181. MUNDY, H. G. Annual report of crop experiments. Gwebi experiment farm, 1921-22. Rhodesia Agric. Jour. 19: 656-663. 1922.—These experiments deal chiefly with the rotation of crops, especially maize. Feeding Sunn Hemp seed had no injurious effect on cattle.—L. J. Goldblatt.

2182. MUNDY, H. G. Annual report of experiments 1921-22. Experiment Station, Salisbury. Rhodesia Agric. Jour. 19: 536-547. 3 fig. 1922.—The report deals chiefly with maize experiments.—L. J. Goldblatt.

2183. MUNDY, H. G. Bulawayo municipal experiment station. First report. Rhodesia Agric. Jour. 19: 583-587. 1922.—A brief discussion of the crops grown during the season of

1921-22 is given together with a tabulated account of results. Cereals, legumes, hay and pasture grasses were grown.—*L. J. Goldblatt.*

2184. NEETHLING, J. H. **Our wheat production in the future. Probable areas of cultivation and their needs.** South African Jour. Indust. 6: 40-45. 1923.—The author discusses certain potential wheat producing areas and such factors as the advisability of increasing the the productiveness of Western Province wheat lands.—*L. J. Goldblatt.*

2185. NEETHLING, J. H. **Problems of wheat growing in South Africa.** South African Jour. Indust. 6: 81-87. 1923.—The problems discussed here are those of the green manuring of wheat lands, the need for cheap agricultural lime, pastures for dry summer areas, etc. Recent developments in the search for, and improvement of likely varieties are also discussed.—*L. J. Goldblatt.*

2186. NEETHLING, J. H. **Wheat in South Africa.** South African Jour. Indust. 5: 495-500. 1922.—The writer discusses the yields for the different provinces and wheat districts of South Africa. In South Africa insufficient wheat is produced for home consumption. The average yields are very low, a fact partly responsible for the high cost of production.—*L. J. Goldblatt.*

2187. [O'BRIEN, C. H.] **C. H. O'Brien's report on the sugar industry.** South African Sugar Jour. 7: 681-697. 1923.—The report deals with the sugar belt in Zululand and is principally concerned with the economic, agricultural and tilling aspects of sugar production. Uba is the sole variety of cane planted and the average yield of cane on a 2-year basis is about 20-30 tons per acre. Lengthy ratooning appears to be a common practice. Over a 9-year cycle an average of 12.98 tons of cane produce a ton of sugar. The yield of sugar per acre is about 1 ton.—*C. Rumbold.*

2188. PATTEN, G. R. **A summary of some experiments carried out by the Bureau of Sugar Experiment Stations, IX.** Queensland Agric. Jour. 20: 161-167. 1923.—Details of analyses of feed-stuffs such as cane leaves, grasses, cane-top ensilage, etc., are given.—*W. D. Francis.*

2189. PATTERSON, T. H. **Pasture top dressing experiments at Te Kuiti.** New Zealand Jour. Agric. 26: 233-238. 5 fig. 1923.—A 2-years' experiment was conducted in fertilizing permanent pasture lands on light, undulating soil in New Zealand which had been laid down about 8 years and had received no fertilizer for at least 5 years previous to the dressings, which were applied Sept. 1921 and Sept. 1922. Taking the average yield of the 2 seasons, superphosphate on the unlimed area has given the highest yield of hay, having produced an increase of approximately 87% above no manure, while basic slag has increased the yield 41% and raw ground rock phosphate 37%. On the limed area the yield of hay from super-phosphate was 75% above the area receiving no manure, while rock phosphate gave only 20% increase in yield. From the point of view of pasture improvements the area on which superphosphate and lime had been applied stood out strikingly. The plots to which raw ground rock phosphate and lime had been applied were pale in color and starved in appearance and the general growth was poor. On the unlimed area the plots which received superphosphate produced a vigorous growth. The area which received raw ground rock phosphate but no lime showed a good growth of grass. Definite conclusions cannot be drawn until the experiment has continued over at least 5 years.—*Mary R. Burr.*

2190. RADER, F. E. **Report of work at Matanuska station.** Ann. Rept. Alaska Agric. Exp. Sta. 1921: 16-23. Pl. 5-6. 1923.—Rye promised well and winter wheat was sown for the first time; a number of varieties each of spring wheat, oats and barley were grown, also alfalfa, clover and grasses. Potatoes averaged 283 bushels per acre and most root crops did well. A few vegetables were grown. Root maggots on cabbage were noted for the first time. Red raspberries covered with spruce boughs and straw bore well but unprotected canes froze back severely. Reports are given on strawberries, currants, gooseberries, and shrubs.—*J. P. Anderson.*

2191. REID, W. D. **Lucerne growing in Vincent county (Central Otago).** New Zealand Jour. Agric. 26: 218-227. 7 fig. 1923.—The region has the lowest rainfall of any in New Zealand. Seeding, method of culture, fertilizing, irrigation, management, and conditions leading to deterioration are discussed.—*Mary R. Burr.*

2192. REMY, E. *Über Sojabohnenmilch.* [Soybean milk.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 43: 380-381. 1922.—Proximate analyses are given.—*E. E. Stanford.*

2193. REYNOLDS, MARK H., AND A. N. SHEPHERD. *Farmers' experiment plots. Maize experiments, 1922-23.* *Agric. Gaz. New South Wales* 34: 722-726. 1 fig. 1923.—Maize variety trials were carried out upon a number of private farms with several varieties. Only fair yields were secured.—*L. R. Waldron.*

2194. SANDO, W. J. *Climate and wheat yields at College Park, Maryland.* *Jour. Amer. Soc. Agron.* 15: 400-408. 1923.—A negative correlation has been found to exist between rainfall and the corrected yield of 4 varieties of wheat. Yields above normal are associated with sub-normal rainfall for the months of March and May. No definite relation seems to exist between yields of the varieties studied and other climatic factors as snowfall, temperature and sunshine.—*F. M. Schertz.*

2195. SHEPHERD, A. N. *Cotton-growing under irrigation.* *Agric. Gaz. New South Wales* 34: 727-730. 1923.—Practical instructions are given for growing the crop.—*L. R. Waldron.*

2196. SMITH, F. B. *Prickly pear as stock feed.* *Proc. Roy. Soc. Queensland* 33: 1-29. 1921.—A detailed account of the results of a series of feeding experiments is given in which *Opuntia inermis* was fed in various forms to stock. The prickly pear was supplemented with other foodstuffs in some cases, and chemical analyses of the rations fed are shown. It is concluded that prickly pear is a wholesome cattle feed, but alone will not enable cattle to subsist for more than limited periods. The succulence of the plant will satisfy the water requirements of cattle and sheep in cool seasons.—*W. D. Francis.*

2197. STAPLEDON, R. G. *Seed mixtures for grassland.* *Jour. Ministry Agric. Great Britain* 30: 130-142. 1923.—Departing from the advice customarily given in Great Britain for laying down permanent grassland, the writer advocates the use of simple mixtures of a few well-chosen grasses and clovers rather than elaborate mixtures of many species. His objections to the complex mixtures are the excessive competition between species, the certainty that some species will not be adapted and the fact that different species require very different conditions for germination and growth. Suggested mixtures are discussed in detail under the groups (a) stubble or autumn bite, (b) one-year ley, (c) two-year ley, and (d) three-year ley or upwards.—*L. W. Kephart.*

2198. STEAD, A., AND E. N. S. WARREN. *Prickly pear. Its value as a fodder for sheep in droughts and in ordinary times.* *Union South Africa Dept. Agric. Bull* 1922⁴: 1-12. 2 fig. 1922.—Sheep readily take over 12 pounds of prickly pear per day for over 250 days, and if amply supplied with pear require no other water. Prickly pear alone is not a sufficient ration for the maintenance of camels, much less for the maintenance of ewes in milk, but it is invaluable in times of drought both as a source of water and of food, and sheep can live at least 250 days on prickly pear only, provided they are in good condition when the feeding begins. It is a valuable succulent roughage for sheep, for fattening and production purposes in general, provided it is fed with protein-supplying foodstuffs such as lucerne hay.—*E. M. Doidge.*

2199. STEVENSON, T. M. *Technique of field husbandry experimentation.* *Sci. Agric.* 4: 41-54. 1923.—Beginning with an outline of the history and development of agricultural experimental work in Great Britain, U. S. A., and Canada the author discusses in turn the laying out of an experimental field and of a breeding nursery, classification of work according to the size of the unit, check plots, record keeping, and machinery.—*T. G. Major.*

2200. TAYLOR, ALEXANDER J. *The composition of some indigenous grasses.* *South African Jour. Sci.* 19: 218-232. 1922.—Ruderal grasses usually have a better composition and a higher feeding value than do the ordinary grasses of the climax veld, while pioneer and post-climax grasses are generally coarse and inferior in feeding value. Individual and seasonal variations are considerable, especially as regards ruderal species. *Themeda triandra*, the principal veld grass from the stock farmer's point of view, has also about the best composition and feeding value of the grasses of its type. The crude fiber content affords probably the best criterion for determining the relative feeding values of grasses, the feeding value being in inverse ratio to the fiber content. *Rotiboa compressa* varies in protein content as it grows in the vlei or on the hillside. The phosphate content is very constant for the average veld-grass, being about 0.2% of the dry matter of the grass. In ruderal species the amount is about 0.3-0.4% and this is rather variable.—*A. J. Taylor.*

2201. TAYLOR, H. W. The growing of Virginia tobacco in southern Rhodesia. Field operations. Rhodesia Agric. Jour. 20: 373-403. 2 pl. 1923.—The cultivation of tobaccos grown from varieties originating in America is discussed.—L. J. Goldblatt.

2202. THATCHER, R. W. The effect of one crop on another. Jour. Amer. Soc. Agron. 15: 331-338. 1923.—There is as yet no positive proof of the nature of the causative agent or agencies for either the beneficial or the injurious effect of one crop upon another. It may vary widely in different cases and may be chemical or bacterial in character. Definite proof that observed injurious effects on a second crop are due to toxic chemical substances in the soil produced by or in association with the first crop has not yet been established.—F. M. Schertz.

2203. VUILLET, J. La culture de la luzerne dans l'Arizona. [Alfalfa cultivation in Arizona.] Rev. Bot. Appl. et Agric. Coloniale 2: 277-279. 1922.—The growing of alfalfa as a fertilizing agent in the Salt River Valley of Arizona is described, with a discussion of the costs of cultivating this crop.—Paul Russell.

2204. WALTERS, J. A. T. Ensilage. Rhodesia Agric. Jour. 20: 426-432. 1 fig. 1923.—Silage has proved the best succulent foodstuff during the winter months. The value of different silages, and methods of ensiling are discussed.—L. J. Goldblatt.

2205. WALTERS, J. A. T. Legumes in southern Rhodesia. Rhodesia Agric. Jour. 20: 188-195. 8 fig. 1923.—The author deals with the uses and culture of leguminous crops. The Rhodesian farmer has available many legumes for the varying farm uses. Leguminous trees as the Acacias, M'sasa (*Brachystegia randii*), M'nondo (*Berlinia paniculata*), M'futi (*Brachystegia goetzii*), Mopane (*Copaifera mopane*), etc., abound and the so-called "vaal bosch" (*Eriosema insigne*) is plentiful around Salisbury and on the prevailing red soils. Among the native herbaceous legumes grazed by stock are the Rhodesian lucerne (*Alysicarpus* spp.), a few of the many wild indigos (*Indigofera* spp.), the sweet-pea-like plant "Gumba-gumba" (*Dolichos lupiniflorus*), and the Rhodesian kudzu vine, an undetermined species resembling the imported variety.—L. J. Goldblatt.

2206. WARE, W. M., AND J. E. CHAMBERS. Garlic-scented pennycress: a weed new to Britain. Jour. Ministry Agric. Great Britain 30: 535-538. 3 fig. 1923.—*Thlaspi alliaceum* although of general distribution in southern Europe, has been discovered for the 1st time as a weed in Great Britain, in a grain field near Ashford, Kent. Besides being excessively seedy the plant is reported to be poisonous to cattle and eradication as for any annual is urged. The plant resembles *T. arvense* except for its smaller size, less winged seed pod and the strong onion-like odor.—L. W. Kephart.

2207. WHITE, C. T., AND W. D. FRANCIS. Queensland trees, No. 17. Queensland Agric. Jour. 19: 78-80. Pl. 26-27. 1923.—Some of the field characteristics of *Sideroxylon australe* and its distribution are given.—W. D. Francis.

2208. WHITE, W. T. Report of work at Kodiak station. Ann. Rept. Alaska Agric. Exp. Sta. 1921: 44-46. Pl. 10-12. 1923.—Native bluetop (*Calamagrostis Langsdorfii*) forms 90% of the upland hay around Kodiak while *Elymus mollis* and *Carex cryptocarpa* are the principal species used for silage. Considerable increase is noted in grasses and forage plants on ash covered areas.—J. P. Anderson.

2209. WHITTET, J. N. The cultivation of saltbush for feed. Agric. Gaz. New South Wales 34: 745. 1923.—*Atriplex nummularia* is recommended for feeding. Seed should be started in nursery beds and transplanted when plants are 12 inches high. Seed should germinate in 10 days and plants may be grazed in 8-12 months.—L. R. Waldron.

2210. WILLIAMS, R. D. Depth of sowing grass and clover seeds. Jour. Ministry Agric. Great Britain 29: 132-137. 1922.—White clover seedlings are less blunt than red clover seedlings and are able to force their way through the soil more easily. Thus, when sown at a depth of $\frac{1}{2}$ inch, 95% of white clover seedlings reached the surface as compared with only 74% of red clover seedlings. On the other hand the smaller amount of reserve food material in the cotyledons caused white clover seedlings to fail to reach the surface from depths of 2-3 inches; the optimum depth was $\frac{1}{4}$ - $\frac{1}{2}$ inch. Surface seedings, except during prolonged periods of wet weather, and seedings over 1 inch in depth should be avoided.—Cocksfoot (orchard grass), like perennial ryegrass, gave very poor results when sown on the surface and even poorer

results when sown 2-3 inches deep. It appears very important that cocksfoot should be sown at a depth of $\frac{3}{8}$ - $\frac{1}{2}$ inch. Meadow foxtail must be sown during warm dry weather in June or July rather than in the spring since the caryopses readily decompose in wet cold weather due to the constant saturation of the large hairy glumes. Surface seeding is possible but not desirable, the best depth being $\frac{1}{2}$ - $\frac{3}{4}$ inch; 2-3 inch sowing results in complete failure. Rough stalked meadow grass needs but light covering; $\frac{1}{8}$ - $\frac{1}{4}$ inch in dry weather and surface seeding in wet weather is preferred.—*L. W. Kephart*.

2211. WILSON, W. B. Cotton as a rotation crop with cane. *South African Sugar Jour.* 7: 808 e-808 g. 1923.—Cotton was suggested as a good crop to rotate with Uba cane in the Umhlali district. October seemed the best month for planting. It should not be grown in the same field for a period of years because of the rapid spread of the boll rot and the insect causing the staining of the lint. The Sea Island variety of cotton did not grow well; the temperature was not high enough and it was susceptible to plant diseases and pests. Good varieties of cotton for this region are Griffin or Bancroft Improved, Cleveland Big Boll, and Watts' Long Staple; the last is susceptible to insect pests.—*C. Rumbold*.

2212. WINKLER, E. A. How to grow Hubam. *Gleanings in Bee Culture* 51: 36-38. 1923.—As the seed of this annual white sweet clover (a variety of *Melilotus alba*) can not be distinguished from that of the biennial form, care should be taken to purchase only from reliable dealers. Since Hubam must make its growth in about 6 months, 50 per cent more lime should be added to the soil than is necessary for the biennial. Inoculation of the seed is desirable as described in U. S. Dept. Agric. Farmers' Bull. No. 797. Almost all acreages of Hubam in the future will be planted with grain. On well-limed soils 10 pounds of seed to the acre give excellent stands, but on hard clay soils 15 pounds should be sown. The crop should be cut for seed when three-fourths of the pods are black.—*J. H. Lovell*.

2213. WOOD, T. B. The chemistry of crop production. 193 p. W. B. Clive: London, 1920.—This elementary but comprehensive discussion, in story form, concerns soil chemistry, soil physics, and manuring, particularly as they are related to crop production and crop distribution in Great Britain. Other phases of agricultural chemistry are not discussed but considerable reference is made to soil bacteriology, soil surveying, and meteorology.—*L. W. Kephart*.

2214. ZLATEROFF, AS., UND IW. TRIFONOW. Die bulgarische Sojabohne. [Bulgarian soybeans.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 44: 214-215. 1922.—Soybeans have only recently been cultivated in Bulgaria, and to a small extent. Proximate analyses of beans from different regions are reported. Soybeans as marketed are often mixed with the "Papuda," (*Phaseolus radiatus*) a less valuable bean cultivated extensively in Macedonia. Analyses of these are given, indicating protein 18.55% and fat 1.50% as against 36.76% and 18.57% respectively for the soybean. Analyses of soybean milk are also given.—*E. E. Stanford*.

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

C. W. DODGE, *Editor*

CHARLES A. WEATHERBY, *Assistant Editor*

(See also in this issue Entries 2163, 2199, 2302, 2341, 2388, 2594, 2611, 2710, 2711, 2712, 2713, 2736, 2803, 2849, 2853, 2865, 2998, 3121, 3158, 3159)

2215. ANONYMOUS. A quarter century of cumulative bibliography, retrospect and prospect. 44 p., 15 fig. H. W. Wilson Co.: New York, 1923.—This article gives a brief sketch of the growth of the index publication of the H. W. Wilson Company and a discussion of methods used in cumulative bibliography.—*C. W. Dodge*.

2216. ANONYMOUS. Current topics. *Nature* 112: 632. 1923.—This notes a movement to create, in memory of I. B. Balfour, a botanic garden or arboretum for trial of newly imported trees.—*O. A. Stevens*.

2217. ANONYMOUS. Giacomo Ciamician, 1857-1922. *Bull. Soc. Chim. Biol.* 5: 79-80. 1923.

2218. ANONYMOUS. [Journal of the Department of Agriculture, Kyushu Imperial University, Fukuoka, Japan.] Jour. Dept. Agric. Kyushu Imp. Univ. 1: cover pages. Mar. 30, 1923.—It is requested that all correspondence concerning this new journal be addressed to the Director of the Department of Agriculture, Kyushu Imperial University, Fukuoka, Japan.—The 1st number consists of a single article (133 pages) in German by Riichiro Kôketsu: Über die Wirkung der Elektrischen Reizung an den Pflanzlichen Zellgebilden.—*J. R. Schramm*.

2219. ANONYMOUS. London Botanical Gardens. Chem. and Druggist 98: 919-932. Fig. 1-30. 1923.—In this historical account of the botanical gardens of London, reference is made to the fact that the establishment of the early botanical gardens was usually in connection with the study of drug plants. The apothecaries' societies were the originators of most of the present well-known gardens of London. Descriptions and illustrations are included of the Chelsea Physic Garden dating from 1673, which was among the first and remains the oldest botanical garden in London; the Kew Gardens, a development of the famous horticultural gardens surrounding Kew House and dating at least from 1759; and the Royal Botanic Society's Garden in Regent's Park.—*E. N. Gathercoal*.

2220. ANONYMOUS. Mr. L. Lewton Brain. Kew Bull. 1922: 199. 1922.—A short account is presented of the life and work of Brain, who died at Kuala Lumpur, June 24, 1922.—*T. J. Fitzpatrick*.

2221. ANONYMOUS. Obituary notice of F. Arnold Lees. Naturalist 1921: 272-273. 1921.

2222. ANONYMOUS. Obituary notice Rev. E. Adrian Woodruffe-Peacock, 1858-1922, with portrait. Naturalist 1922: 137-139. 1922.

2223. ANONYMOUS. Presentation of Mr. William Hancock's herbarium. Kew Bull. 1922: 204. 1922.—Mr. Hancock was born at Lurgan in Ulster in 1847, educated at Queen's College, Belfast, spent many years in the service of the Chinese Imperial Maritime Customs, and died at Bristol in 1914. He collected extensively in China and Formosa, also in periods of leave in Japan, Java, Sumatra, and later in Central America and West Indies. His entire herbarium is placed at the disposal of Kew.—*T. J. Fitzpatrick*.

2224. ANONYMOUS. Scientific papers and books. Nature 112: 565-566. 1923.—This is a leading editorial dealing with scientific literature in general but with particular reference to reviews appearing in Nature.—*O. A. Stevens*.

2225. ANONYMOUS. [The British Journal of Experimental Biology.] Nature 112: 553-554. 1923.—The 1st number of this new publication is noted.—*O. A. Stevens*.

2226. ANONYMOUS. The royal botanic gardens, Ceylon. Kew Bull. 1922: 207-208. 1922.—This article gives a general account of the founding, growth, and development of the gardens, and of research work done in them.—*T. J. Fitzpatrick*.

2227. ANONYMOUS. William Henry Pearson, M.Sc., A.L.S., 1849-1923. British Bryological Soc. Rept. 1: 39-40. 1923.—Pearson was born at Pendleton, near Manchester, England, July 22, 1849, and died at Manchester, Apr. 19, 1923. Although interested in other groups of plants he devoted most of his attention to the hepatics, in the study of which he attained unusual prominence. Aside from his Hepaticae of the British Isles, completed in 1902, he published numerous papers on both British and foreign species.—*A. W. Evans*.

2228. ANONYMOUS. William Ingham, B.A., 1854-1923. British Bryological Soc. Rept. 1: 40-41. 1923.—Ingham was born at Manchester, England, in 1854 and died at York, May 25, 1923. "An ardent student of bryology" he devoted much attention to the mosses and hepatics of Yorkshire and published many papers about them. From 1903 to 1922 he served as secretary of the Moss Exchange Club.—*A. W. Evans*.

2229. AYSCOUGH, FLORENCE. The Chinese idea of a garden. China Jour. Sci. and Arts 1: 15-22, 135-138, 236-242, 326-328. 7 pl. 1923.—After a discussion of Chinese esthetics of gardening, the author describes the garden of Pan Yün-tuan or Pan En at Shanghai and briefly gives its history from its foundation in 1559 to 1761 when it became a public garden, and its decline since 1861. This is followed by an historical review of the treatises on the cultivated flowers. The last instalment is devoted to a description of an old garden in Soochow.—*C. W. Dodge*.

2230. BARNES, E. W. The influence of science on Christianity. *Nature* 112: 477-478. 1923.
2231. BATESON, W. The revolt against the teaching of evolution in the United States. *Nature* 112: 313-315. 1923.—The writer considers that his Toronto address was misrepresented by the newspapers and used as political propaganda, resulting in the bills introduced in the legislatures of several states prohibiting the teaching of evolution. He regards Europe as fairly safe against such disturbances, but that a repetition of such events there might take place.—O. A. Stevens.
2232. BAYFORD, E. G. Obituary notice of H. H. Corbett of Doncaster, 1856-1921. *Naturalist* 1921: 145-149. 1921.
2233. BEGUINOT, AUGUSTO. Le piante nella Divina Commedia. [Plants in the "Divine Comedy."] *Arch. Storia Sci.* 3: 277-282. 1923.
2234. BEGUINOT, AUGUSTO, E SILVIA ZENARI. Illustrazione dell'erbario composto da G. B. Brocchi in Egitto e Nubia (1822-1826). [Notes from the herbarium of G. B. Brocchi collected in Egypt and Nubia (1822-1826).] *Arch. Storia Sci.* 1: 387-396. *Portrait.* 1920; 2: 65-69, 185-198, 332-355. 1922.—This article consists of a list of plants and their localities arranged in fascicles by localities with the modern names of the plants. [See also Bot. Absts. 13, Entries 2242, 2292.]—C. W. Dodge.
2235. BORZA, AL. Le bryologue Martin Péterfi. [The bryologist M. Péterfi.] *Bull. Soc. Stiințe Cluj* 1: 597-603. *Portrait.* 1923.—This contains a complete bibliography of his works.—A. Borza.
2236. BROTHERSTON, R. P. Garden Kalendars. *Gard. Chron.* 72: 264. 1922.—There are given notes and additions to an article by Joseph Jacob (*Gard. Chron.* 72: 20-21, 136, 252. 1922 [see Bot. Absts. 13, Entry 717]) on the same subject.—P. L. Ricker.
2237. BROTHERSTON, R. P. Hogg on florists' flowers. *Gard. Chron.* 72: 268-269. 1922.—Notes are given on the 1st and 2nd editions of Hogg's work, and on some of the plants in which he was most interested.—P. L. Ricker.
2238. BROTHERSTON, R. P. Stephen Switzer. *Gard. Chron.* 73: 230. 1923.—There are described 2 works by Switzer, the *Compendious Method*, x + 78 p., a seedsman's advertisement dealing with garden vegetables and forage crops, and a *Dissertation on the True Cythisus of the Ancients*, 79 p., followed by an account of seeds, in which reasons for the failure of germination are given and a list of seeds offered for sale.—P. L. Ricker.
2239. BÜREN, G. V. Dr. Eugen Dutoit. *Mitteil. Naturf. Ges. Bern* 1921: 309-312. *Portrait.* 1922.
2240. CHEETHAM, CHRIS. A. Obituary notice of William Ingham, 1854-1923. *Naturalist* 1923: 238-239. 1923.
2241. CHIOVENDA, EMILIO. Di un rarissimo incunabulo dell'opera agraria di Pietro del Crescenzi. [A very rare incunabulum of the agricultural works of Pietro dei Crescenzi.] *Arch. Storia Sci.* 3: 313-315. 1923.—This article gives the collation of "Ce present liure intitule des prou | fitz champestres et ruraulx compile par maistre Pierres des Crescences bourgeois de boulongne la crasse aeste ache | ue de imprimer en la noble ville et cite | de Paris par honorable homme Anthoineve | rard marchand libraire et bourgeois de | Paris demourant au lieu sur le pont | nostre dame a limage saintet Jehan le | uangeliste et tenant bouticle au palais | du Roy nostre sire deuant la chapelle ou len | chante la messe des messeigneurs les presidens [10 July 1486]."—C. W. Dodge.
2242. CHIOVENDA, EMILIO. Illustrazione dell'erbario composti da G. B. Brocchi in Egitto e Nubia (1822-1826). [Notes from the herbarium of G. B. Brocchi collected in Egypt and Nubia (1822-1826).] *Arch. Storia Sci.* 3: 244-260. *Fig. 8.* 1923.—This is a continuation of articles by Beguinot and Zenari [see Bot. Absts. 13, Entries 2234, 2292].—C. W. Dodge.
2243. DADANT, C. P. The Huber letters. *The Amer. Bee. Jour.* 63: 297. 1923.—These letters concern Huber's observations on the collection and manipulation of propolis.—J. H. Lovell.
2244. DETONI, ETTORE. Appunti botanici del codice-erbario di P. A. Michiel. [Botanical notes on the herbarium of P. A. Michiel.] *Arch. Storia Sci.* 1: 113-136. 1919.—Extensive extracts are given, furnished with comprehensive notes by the editor.—C. W. Dodge.

2245. DETONI, G. B. Nella ricorrenza del II centenario della morte di Antonio van Leeuwenhoek, frammenti Cestoniani inediti. [On the occurrence of the second centenary of the death of Anton Leeuwenhoek, unpublished fragments of Cestoni.] Arch. Storia Sci. 4: 224-232. Fig. 32-35. 1923.—Extensive extracts from the correspondence of Cestoni (1637-1718) are given, regarding the discoveries of Leeuwenhoek (1632-1723).—*C. W. Dodge*.

2246. DETONI, G. B., ED A. FORTI. Ethel Sarel Barton Gepp. Nuova Notarisia 34: 47-57. Portrait. 1923.—Mrs. Gepp (Miss Barton) was born at Hampton Court Green, Middlesex, England, Aug. 21, 1864, and died at Torquay, Apr. 6, 1922. She was the author of notable papers on the marine algae, the later ones written in collaboration with her husband, Antony Gepp. They relate especially to the algae of the Antarctic regions and to various groups of the order Siphonales of the Chlorophyceae.—*Marshall A. Howe*.

2247. FISCHER, ED. Dr. Konrad Leist. 1863-1920. Mitteil. Naturf. Ges. Bern 1920: 175-176. 1921.

2248. FISCHER, ED. Flora helvetica 1530-1900. Nachträge. [Swiss flora 1530-1900. Supplement.] Bibliographie Schweizerischen Landeskunde IV. 5: ix + 40 p. K. J. Wyss Erben: Bern, 1922.—There are given additions to and corrections of the author's contribution of 1901.—*C. W. Dodge*.

2249. GAMBLE, J. S. John Firminger Duthie. Kew Bull. 1922: 125-128. 1922.—Duthie (May 12, 1845-Feb. 23, 1923) was educated at Cambridge, traveled in Italy, and for 27 years was superintendent of the botanic garden at Saharanpur, in northwest India. The article includes a bibliography of publications.—*T. J. Fitzpatrick*.

2250. HASKELL, R. J. The fifth annual summer meeting of the American Phytopathological Society. Phytopathology 13: 507-508. 1923.—A brief report is made on the meeting and field excursions of this Society in the western section of New York and in Ontario, Canada, July 9-12, 1923.—*B. B. Higgins*.

2251. HEIBERG, J. L. Naturwissenschaften, Mathematik und Medizin im klassischen Altertum. [Natural sciences, mathematics, and medicine in classical antiquity.] 2nd. ed., 104 p. B. G. Teubner: Leipzig, 1920. [No. 370 of Aus Natur und Geisteswelt.]

2252. HESDÖRFFER, MAX. Johannes Böttner. Gartenwelt 23: 176. 1919.—Johannes Böttner died Apr. 28, 1919, at the age of 58 years. He was a prominent writer on horticulture and editor of Praktischen Ratgeber and was the originator of several important strawberries and rose hybrids.—*J. C. Th. Uphof*.

2253. HILL, A. W. Sir John Kirk. Kew Bull. 1922: 49-63. 1922.—Sir John (Dec. 19, 1832-Jan. 15, 1922) spent much of his life in Africa, from which over a long period of years he sent to Kew extensive and valuable collections. The genus *Kirkia* was dedicated to him by Oliver and over a hundred species of plants commemorate his name.—*T. J. Fitzpatrick*.

2254. HITCHENS, A. P., D. R. HOOKER, C. A. KOFOID, I. F. LEWIS, E. D. BALL, C. E. McCLUNG, J. R. SCHRAMM, AND A. F. WOODS. Biological abstracts. Science 58: 236-239. 1923.—The Publications Committee of the Union of American Biological Societies has acted jointly with a similar committee of the Division of Biology and Agriculture of the National Research Council, in reviewing the various phases of a possible single comprehensive system of biological abstracts.—*C. J. Lyon*.

2255. HOUSE, HOMER D. Index to the notebooks of Dr. Charles Horton Peck. 2 + 130 p., typewritten. 1923.—The entries are arranged under the following headings: personal mention; New York localities; flowering plants and ferns; mosses, liverworts, lichens and algae; and fungi.—*C. W. Dodge*.

2256. JORDAN, DAVID STARR. Louis Agassiz, teacher. Sci. Monthly 17: 401-411. 1923.

2257. KARRER, S. Oekonomierat Karl Schmidt. Möllers Deutsch. Gärtnerzeitg., 34: 64-71. 14 fig. 1919.—Karl Schmidt, sole owner of Haage and Schmidt, Erfurt, the well known seed and nursery stock firm, died Feb. 27, 1919.—*J. C. Th. Uphof*.

2258. Козо-Полянский, Б. М. [Kozot-POLJANSKI, B. M.] Изъ исторіи Горенскаго фитографическаго общества. [On the history of the Phytographical Society of Gorenski.] Извѣстія Имп. Вет. Сада Петра Великаго. [News Imp. Bot. Gard. of Peter the Great] 1915:48-52. 1915.—The Phytographical Society of Gorenki was founded in 1809 and was merged with the Imperial Society of Naturalists of Moscow in 1811. Only a

Programme was ever published. An Acta Societatis Phytographicae Gorenkensis was projected but the merger took place before it was published and manuscript which was submitted for it was published in Mem. Soc. Imp. Nat. Moscou 5. The citations of Thunberg in the Flora Capensis ed. Schultes xxix 1823 should refer to Mem. Soc. Imp. Nat. Moscou 5.—*C. W. Dodge.*

2259. LA NICCA, R. Dr. med. Joachim de Giacomi. Mitteil. Naturf. Ges. Bern 1921: 314-317. *Portrait.* 1922.

2260. LECLERC, HENRI. Histoire du lierre. [History of the ivy.] Bull. Soc. Française Hist. Méd. 15: 17-37. 1921.—The author gives an interesting account of the use of *Hedera helix* in medicine from early references connected with Egyptian rites and Bacchic festivals to the present time, illustrating by numerous quotations.—*C. W. Dodge.*

2261. LECLERC, HENRI. L'art d'obtenir des fruits laxatifs d'après Antoine Mizauld. [The art of obtaining laxative fruits according to Antoine Mizauld.] Bull. Soc. Française Hist. Méd. 15: 121-124. 1921.—Antoine Mizauld in his Jardinage (1578) suggests growing plants in soil treated with various purgatives to secure a laxative effect in the fruit.—*C. W. Dodge.*

2262. LECLERC, HENRI. Un remède de Guy Patin: le sirop de roses pâles. [Guy Patin's remedy: sirup of pale roses.] Bull. Soc. Française Hist. Méd. 15: 212-216. 1921.

2263. LIECHTENHAN, EDUARD. Beiträge zur Erklärung und Emendation von Benennungen von Heilkräutern und ä. des ersten Glossars des Codex Vaticanus Reginae Christinae 1260 saec. X. Corpus Glossariorum latinorum III. 549-579. [Notes on the meaning and emendation of names of medicinal plants and others in the first glossary of the Codex Vaticanus Reginae Christinae 1260 saec. X. given in Corpus Glossariorum latinorum III. 549-579.] Arch. Geschichte Med. 13: 116-125. 1921.

2264. LIVET, LOUIS. Contribution à l'étude historique de la jusquiame. [Contribution to a historical study of henbane (*Hyoscyamus*).] Bull. Soc. Française Hist. Méd. 16: 165-176. 2 fig. 1922.

2265. MCCALLUM, A. W. Abstracts of Canadian plant pathological literature. Ann. Rept. Quebec Soc. Protection of Plants 14: 110-115. 1922.—The author gives 97 citations and abstracts of papers appearing in Canadian publications, a few prior to but most during 1921.—*B. T. Dickson.*

2266. MCCALLUM, A. W. Abstracts of Canadian plant pathological literature. Ann. Rept. Quebec Soc. Protection of Plants 15: 127-129. 1923.—The list includes 31 citations and abstracts of papers appearing in Canadian publications, mostly during 1922.—*B. T. Dickson.*

2267. MAGNIN, A. Aperçu d'une histoire de la mycologie dans la région lyonnaise. [History of mycology in the region of Lyon.] Bull. Trimest. Soc. Mycol. France 39: 131-152. 1923.—The author gives an account of the investigators who have contributed to the knowledge of the fungus flora of Lyon and environs. The most important are: Claret de Fleurier de la Tourette (1729-1793), Rozier (1734-1793), Gilibert (1741-1814), Balbis (1765-1831), Roffavier (1775-1866), and J. L. Hénon (1830-1872). For the latter a biographical sketch and a review of his works is given.—*S. Blumer.*

2268. MAHEUX, G. Provancher, the Canadian Linnaeus. Ann. Rept. Quebec Soc. Protection of Plants 15: 39-42. 1923.—An outline is given of the life of Abbé Provancher (1820-1892). Of botanical interest among his published works are: Traité Élémentaire de Botanique, 1858; Le Verger Canadien, 1862; and Flore Canadienne, 1862.—*B. T. Dickson.*

2269. MECHNIKOVA, OLGA. Life of Elie Metchnikoff, 1845-1916. xxiii + 297 p., *portrait.* Houghton Mifflin Co.: Boston, 1921.—This seems to be an American imprint of a translation printed in Great Britain.—*C. W. Dodge.*

2270. MIELI, ALDO. [Rev. of: FORTI, ACHILLE. Studi sulla flora della pittura classica veronese. [Studies of the flora of classic paintings of Verona.] 172 p., 9 pl. Tip. Cooperativa: Verona, 1920. [Also issued as Madonna Verona 14: no. 2-3. fasc. 54-55.] Arch. Storia Sci. 2: 106-107. 1920.

2271. MOLLIARD, M. Gaston Bonnier 1853-1922. Bull. Trimest. Soc. Mycol. France 39: 93-95. 1923.—In addition to his works on the influence of alpine and arctic climate on higher plants and on the function of chlorophyll, Bonnier was occupied with mycological researches.

Together with Mangin he studied the respiration of fungi and the synthesis of lichens.—*S. Blumer.*

2272. MORSE, EDWARD S. Agassiz and the school at Penikese. *Science* 58: 273-275. 1923.—This address was delivered at the 50th anniversary of the founding of what is now the Marine Biological Laboratory at Woods Hole, Massachusetts.—*C. J. Lyon.*

2273. PAOLI, UMBERTO GIULIO. Alcuni manoscritti inediti di botanica lucchese. [Some unpublished manuscripts on the botany of Lucca.] *Arch. Storia Sci.* 4: 256-257. 1923.—This is a list of 13 titles by Baldassare, Campi, Pissini, Puccinelli, Fiorentini and Barsanti.—*C. W. Dodge.*

2274. PAOLI, UMBERTO GIULIO. Il libro di Garcia da Orta, contributo alla storia della scienza lusitana. [The works of Garcia da Orta, contribution to the history of Portuguese science.] *Arch. Storia Sci.* 2: 202-210. 1921.

2275. PAYNE, C. HARMAN. History of the moss rose. *Gard. Chron.* 72: 223. 1922.—This article is a reply to the criticism of Joseph Jacob [see *Bot. Absts.* 13, Entry 717] in which Payne gives a list of editions of *Le Jardinier Fleuriste* between 1702 and 1821.—*P. L. Ricker.*

2276. PECK, A. E. Obituary notice of Charles Herman Broadhead. *Naturalist* 1920: 323. 1920.

2277. PECK, A. E. Obituary notice of Thomas Hey, one of the founders of the British Mycological Society. *Naturalist* 1919: 404. 1919.

2278. PINOY, P. E. L'oeuvre de Pasteur et le progrès de la mycologie. [The work of Pasteur and the progress of mycology.] *Bull. Soc. Mycol. France* 39: 89-92. 1923.—The author criticizes the mycological works of Pasteur, especially those on *Mucor racemosus* and *Saccharomyces*, and discusses the application of the methods of Pasteur in mycology.—*S. Blumer.*

2279. PROVASI, TIZIANO. Il viaggio e le raccolte botaniche di Domenico Vandelli sui monti del Lago di Como e della Valsassina. [The journey and botanical collections of Domenico Vandelli in the mountains near Lake Como and Valsassina.] *Arch. Storia Sci.* 4: 1-32. *Fig. 1-3.* 1923.—Domenico Vandelli (1735-1816) undertook a journey to the region of Lake Como to investigate mining operations and incidentally botanized there during the summer of 1763. His journal, the basis of his *Fasciculus Plantarum cum Novis Generibus e Speciebus*, Lisbon, 1771, is reprinted in full, using the nomenclature of Fiori, Paoletti and Beguinot, *Flora Analitica d'Italia*. Extensive notes on nomenclature and distribution are appended and the whole furnished with an index of genera mentioned.—*C. W. Dodge.*

2280. S., J. Felix Schönenberger, eidg. Forstinspektor. *Mitteil. Naturf. Ges. Bern* 1921: 312-314. 1922.

2281. SALAMAN, REDCLIFFE N. Seedsmen's catalogue. *Gard. Chron.* 72: 311-312. 1922.—Notes on recent catalogues dealing especially with the varieties of Irish potatoes are given.—*P. L. Ricker.*

2282. SAVAGE, S. A rare early tract on tulip growing. *Gard. Chron.* 73: 31. *Fig. 13.* 1923.—Some copies of *Hortus Floridus* (1614) by Crispijn vande Pas, the Younger, contain one of the rarest early tracts on tulip culture, by the same author, entitled *Een Cort Verhael van de Tulipenen*. It was also issued in French and comprises 4 pages of text, accompanied by an engraved plate of a transplanting instrument invented by Albert and Guillemme de Heuclum. The use of the instrument is described as are also 3 kinds of tulips with methods of cultivation.—*P. L. Ricker.*

2283. SAVASTANO, LUIGI. Di una rara edizione del "Liber cultus ruris" del Crescenzo. [A rare edition of Crescenzo's "Liber cultus ruris."] *Arch. Storia Sci.* 3: 312. 1923.

2284. SHEPPARD, T. Obituary notice of John Gilbert Baker (1834-1920). *Naturalist* 1920: 367-369. 1920.

2285. SKAN, S. A. Hooker's icones plantarum. *Kew Bull.* 1922: 201-202. 1922.—The appearance of Vol. 1 of the 5th series (Vol. 31 of entire work) is announced, with plates 3001-3100. Parts 1 and 2 were issued in 1915, part 3 in 1916, and part 4 in 1921. A general index to Vols. 1-30 was issued in 1919.—*T. J. Fitzpatrick.*

2286. T [AYLOR], J. W. Obituary notice of William Denison Roebuck. *Naturalist* 1919: 143-149. 1919.

2287. TSCHERMAK, E. Zum 60. Geburtsfeste Professor Dr. Carl Fruwirths. [The 60th birthday of Dr. Carl Fruwirth.] *Zeitschr. Pflanzenzucht* 8: 324-330. 1 pl. 1922.—Fruwirth graduated from the agricultural college at Vienna in 1886 and spent a year travelling and studying in the U. S. A. He was then made professor of agriculture at Mödling and in 1892 accepted (additionally) a docentship at the agricultural college at Vienna, where he did pioneer teaching in plant breeding, following the lead of von Rümker. In 1897 he accepted a professorship of agronomy at Hohenheim and later went to the agricultural college at Vienna as honorary professor. He was not made ordinary professor (with salary) until after the lapse of some years. He owns a place at Amstetten near Vienna where most of his experimental work has been done. He has written many books and innumerable articles on plant breeding, agronomy and allied subjects. He is probably best known as the editor and important author of the 5-volume work (*Handbuch der Landwirtschaftlichen Pflanzenzüchtung*), which has gone through several editions.—*L. R. Waldron*.

2288. VALLAURI, MARIO. L'India e la storia della scienze. [India and the history of science.] *Arch. Storia Sci.* 4: 209-223. 1923.—This article contains brief notes on the history of biological sciences in India.—*C. W. Dodge*.

2289. WARD, F. KINGDON. Sixth expedition in Asia. *Gard. Chron.* 69: 234-235, 298; 70: 43, 100, 124, 184, 220. 1921; 71: 6, 30, 115, 138, 166, 196, 199-230, 260, 290-291, 321-322; 72: 6-7, 34, 52-53, 80, 122, 150-151, 178-179, 208, 238. 1922.—A narrative is presented of the expedition with detailed description of some of the most important finds.—*P. L. Ricker*.

2290. WEST, CLARENCE J., AND CALLIE HULL. List of manuscript bibliographies in the biological sciences. Reprint and Circ. Ser. Nation. Res. Council 45. 51 p. 1923.

2291. WOODHEAD, T. W. Botanical survey and ecology in Yorkshire. *Naturalist* 1923: 97-128. 1923.—This presidential address delivered at Scarborough, Dec. 9, 1922, reviews the work and workers of the past century.—*W. H. Burrell*.

2292. ZENARI, SILVA. Illustrazione dell'erbario composto da G. B. Brocchi in Egitto e Nubia (1822-1826). Appendice: Viaggio in Siria (1823-1824). [Notes from the herbarium of G. B. Brocchi collected in Egypt and Nubia (1822-1826). Appendix: Journey in Syria (1823-1824).] *Arch. Storia Sci.* 3: 261-272. 1923.—This is a continuation of articles by Beguinot and Zenari [see Bot. Absts. 13, Entry 2234] and by Chiovenda [see Bot. Absts. 13, Entry 2242].—*C. W. Dodge*.

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 2213, 2231, 2256, 2269, 2351, 2359, 2458, 2852, 2853, 2860, 2861, 2862, 2897)

2293. BAITSELL, GEORGE A. *Manual of biological forms.* xiv + 411 p. The Macmillan Co.: New York, 1923.

2294. BARTHEL, CHRISTIAN. A review of the present problems and methods of agricultural bacteriology; some impressions gained from a tour of study made in 1922 with the support of the Knut and Alice Wallenberg foundation. 116 p., *illus.* P. A. Norstedt & Sons: Stockholm, 1923.

2295. BERRY, JAMES BERTHOLD. *Farm woodlands: a textbook for students of agriculture in schools and colleges and a handbook for practical farmers and estate managers.* v + 425 p., *illus.* World Book Co.: Yonkers, New York, 1923.

2296. BOWER, F. O. *Botany of the living plant.* 2nd ed., xii + 634 p. Macmillan & Co.: London, 1923. [See also Bot. Absts. 13, Entry 1433.]

2297. BROWN, HENRY HILTON. *By meadow, grove and stream: an introduction to nature study.* 8 vo, 196 p., 18 pl. Religious Tract Soc.: London, 1923.

2298. BURGESS, THORNTON W. *The Burgess flower book for children.* xviii + 350 p., *illus.* Little, Brown and Co.: Boston, 1923.

2299. CANNON, WALTER B. *A laboratory course in physiology.* 4th ed., xvi + 157 p., *illus.* Harvard Univ. Press: Cambridge, 1923.

2300. CLUTE, WILLARD N. Plant names and their meanings. XVII. Cruciferae-II. Amer. Bot. 29: 149-156. 1923.

2301. COCKERHAM, K. L. A manual for spraying. xi + 87 p., illus. The Macmillan Co.: New York, 1923.

2302. DANNEMANN, FRIEDRICH. Die Naturwissenschaften in ihrer Entwicklung und in ihrem Zusammenhange. [The development and relationships of the natural sciences.] 2nd ed. Vol. 1. 486 p., 64 fig. 1920; Vol. 2. 508 p., 132 fig. 1921; Vol. 3. 434 p., 65 fig. 1922; Vol. 4. 628 p., 74 fig. 1923. Wilhelm Engelmann: Leipzig.—This work gives an historical treatise of the development of all natural sciences, especially botany, zoölogy, physics, chemistry, mathematics, cosmology and astronomy. Where possible there is brought forward the relationship between discoveries in different fields, frequently connected with advances in botanical knowledge. With regard to botany, Vol. 1, starting with the early Egyptians, Babylonians, Greeks, Romans, etc., presents data on the study of plants, including pharmacognosy and agriculture of those days. The botanical work of Aristotle, Theophrastus and Pliny is mentioned. Further, the conditions of the middle ages are described and the origin of herbals, up to the revival of the sciences in general. Vol. 2 starts with Galileo and ends with the middle of the 18th century. The works of Swammerdam, Leeuwenhoek, Hooe and Grew, also the discovery of sexuality in plants by Camerarius are mentioned in detail. Vol. 3 describes the further development of the modern natural sciences up to the foundation of the principle of energy. It includes the following subjects: Linnaeus' system; the extension of physical methods in plant physiology; the foundation of the sexual theory; Koelreuter's hybridization experiments; Sprengel's pollination studies; the discovery of amoeboid movement. Vol. 4 covers the period from the discovery of the principle of energy up to the present time. The cell theories of Schleiden and Schwann are presented as well as various theories of evolution, the work of Mendel, and sexuality in cryptogams. In the parts on physics and chemistry many data are presented which are correlated with physiology. At the end of the work a chronological table includes important botanical and physiological discoveries.—J. C. Th. Uphof.

2303. DAVIS, KARY CADMUS. The new agriculture for high schools. iv + 494 p., 345 fig. J. B. Lippincott Co.: Philadelphia and London, 1923.

2304. DIXON, H. H. Practical plant biology. A course of elementary lectures on the general morphology and physiology of plants. xi + 291 p., 94 fig. Longmans, Green and Co.: London, 1922.—The book comprises 30 lectures designed as an introductory course for medical and other science students. Laboratory work is outlined in connection with each lecture. The subjects of the lectures are as follows: the microscope, structure of a cell, Saccharomyces cerevisiae (2 lectures), Chlamydomonas (2), bacteria (2), Spirogyra porticalis, Volvox aureus, Vaucheria sessilis, Mucor, Penicillium glaucum, Fucus platycarpus, Polysiphonia fastigiata, Marchantia polymorpha (2), Funaria hygrometrica, Aspidium felix-mas (2), Selaginella Martensii, Pinus sylvestris (3), Ranunculus bulbosus (2), Scilla nutans, nuclear division, heredity, evolution—theory of descent. [See also Bot. Absts. 12, Entry 1655.]-C. S. Gager.

2305. DUTT, C. P. Biology; an introductory course for classes and study circles. 32 p. Labour Research Dept.: London, [1923?].

2306. EATON, THEODORE H. Vocational education in farming occupations; the part of the public high school. 374 p. J. B. Lippincott Co.: Philadelphia and Chicago, 1923.

2307. EISENBERG, ARTHUR ALEXANDER. Principles of bacteriology. 2nd ed., 214 p. C. V. Mosby Co.: St. Louis, 1923.

2308. ELLIS, DAVID. Practical bacteriology for chemical students. viii + 136 p. Longmans, Green & Co.: London, 1923.

2309. FABRE, J. H. La plante. Causeries sur la botanique. [The plant. Talks on botany.] 10th ed., 355 p., 16 pl., 187 fig. Delagrave: Paris, [1923?].

2310. HANSEN, ALBERT A. A new wild life preserve. Science 58: 242-243. 1923.—The Herbert Davis Forestry Farm near Farmland, Indiana, has been willed to the state and placed in the care of the trustees of Purdue University. It is to be kept as a forest and game preserve and plans are being made to stock it with rare forms that need protection.—C. J. Lyon.

2311. HARVEY-GIBSON, R. J. *British plant names and their derivatives.* v + 50 p. A. and C. Black, Ltd.: London, 1923.

2312. HIRST, HAROLD M. *The Scarborough Pharmacy Club's Herb Garden.* Pharm. Jour. 110: 294-297. Fig. 1-2. 1923.—The author in connection with evening classes in botany, particularly for pharmacists' apprentices, engaged the interest of local pharmacists in establishing an herb garden with the result that the Scarborough Pharmacy Club began this drug garden in March, 1921, on a piece of ground 50 × 22 feet. After 2 seasons, at an expenditure of less than 60 dollars, the garden contains about 125 drug-yielding species and is most attractive as well as profitable in teaching botany to apprentices. The training has been very valuable to the students in their first college year.—*E. N. Gathercoal.*

2313. HUXLEY, JULIAN S. *Essays of a biologist.* xiv + 304 p. A. A. Knopf: New York, 1923.

2314. J[ATUL], P. A. *Abelna botanika.* [Popular botany.] Želmenija 2: 85-87. 1923.

2315. JATUL, P. A. *Mažas Botaniškas Žodynėlis.* Dalis I. *Augmenų Vardai.* [Small botanical dictionary. Part I. Plant names.] Želmenija 1: 20-32, 35-46. 1921; 2: 50-62, 67-72, 83-84, 98-103. 1922; 3: 115-118. 1923.—The author lists the Lithuanian, the Latin and the English plant names in parallel columns.—*C. W. Dodge.*

2316. JIVANNA RAO, P. S. *Lessons in nature study. Water plants.* Jour. Madras Agric. Students' Union 10: 14-17, 58-60, 90-93, 111-115, 160-163, 225-229. 1922.—Aquatic plants are recommended as an interesting subject for nature study. Following a brief general discussion of the adaptations of plants to aquatic conditions, the outstanding features of some of the more common aquatic plants of the Madras Presidency (28 species of flowering plants, also *Marsilea*, *Azolla*, *Chara*, and *Spirogyra*) are described in such a way as to arouse the interest of young students. Simple microscopic observations and physiological experiments conclude the article.—*Winfield Dudgeon.*

2317. KELLEY, TRUMAN L. *Statistical method.* xi + 390 p. The Macmillan Co.: New York and London, 1923.

2318. KISSKALT, KARL. *Praktikum der Bacteriologie. Mit einem Anhang: Vorschriften für Versuchstierzucht,* von MARTIN MAYER. [Laboratory guide for bacteriology. With a supplement: directions for raising animals for experimental use, by MARTIN MAYER.] 5th rev. ed. G. Fischer: Jena, 1923.

2319. LINDSAY, T. S. R. *Plant names.* (Nature Lovers' Series.) 8vo, vii + 93 p. The Sheldon Press: London; Macmillan Co.: New York and Toronto, 1923.

2320. SCHNEIDER, C. K. *Illustriertes Handwörterbuch der Botanik.* [Illustrated lexicon of botany.] Edited by KARL LINSBAUER. 2nd ed., 824 p., 396 fig. W. Engelmann: Leipzig, 1918.—Including the additions, this edition now gives descriptions of over 7,000 terms. The figures have been taken from classical examples in other works. Citations of the first use of the terms are given.—*J. C. Th. Uphof.*

2321. SHAW, ELLEN EDDY. *Ten years of work in elementary education at the Brooklyn Botanic Garden.* Brooklyn Bot. Gard. Leaflets 11¹⁰: 4 p. 1923.—The work done is outlined under the following heads: extension work with teachers; regular classwork for boys and girls out of school time; visiting classes; the outdoor experimental garden; the annual garden exhibit; distribution of packets of seed; and lecture and conference work.—*A. H. Graves.*

2322. TRANSEAU, EDGAR NELSON. *General botany.* x + 560 p., 351 fig. World Book Co.: Yonkers, New York, 1923.—This is an introductory text for colleges and advanced classes in secondary schools. The relation of plants and plant products to human life is emphasized, and the treatment throughout is from the ecological standpoint. Leaves, stems, roots, flowers, fruits and seeds are treated in the order named, with chapters dealing with their structure, functions, and environmental relations. Three chapters treat of genetics and plant breeding, 2 of plant distribution, 9 of systematic botany, 1 of the evolution of plants. Most of the illustrations are original. Many of the chapters are followed by brief bibliographies or by a list of problems.—*C. S. Gager.*

2323. TURRILL, W. B. *Babington's manual of British botany.* Kew Bull. 1922: 203. 1922.—The author gives a short account of the 10th edition issued in 1922 [see Bot. Absts. 12, Entry 6088; also 13, Entry 527].—*T. J. Fitzpatrick.*

2324. ULLRICH, FRED T. The study of soils in relation to Wisconsin conditions; a supplementary text-book for pupils and teachers, prepared especially for use with text-books in agriculture, general science and geography. 55 p., illus. Eau Claire Book and Stationery Co.: Eau Claire, Wisconsin, 1923.

2325. VAN BUSKIRK, EDGAR F., AND EDITH LILLIAN SMITH. The science of everyday life. xv + 416 p., illus. Constable and Co.: London, 1922.

2326. ZIMMER, GEORGE FREDERICK. A popular dictionary of botanical names and terms with their English equivalents. 2nd ed., vi + 122 p. George Rutledge and Sons, Ltd.: London; E. P. Dutton & Co.: New York, [1923].—This is a reissue of a volume published some time ago. The book is in the nature of a "Latin-English" dictionary, no botanical terms being defined except Latin words, chiefly adjectives.—C. S. Gager.

CYTOLOGY

GILBERT M. SMITH, *Editor*

(See in this issue Entries 2519, 2520, 2554, 2563, 2572, 2658, 2728, 2910)

ECOLOGY AND PLANT GEOGRAPHY

GEORGE D. FULLER, *Editor*

(See also in this issue Entries 2194, 2432, 2436, 2438, 2441, 2456, 2458, 2460, 2480, 2491, 2535, 2557, 2590, 2640, 2664, 2666, 2674, 2686, 2714, 2723, 2725, 2837, 2930, 3094, 3138, 3140)

GENERAL, FACTORS, MEASUREMENTS

2327. AITKEN, R. D. The effect of slope exposure upon the climate and vegetation of a hill near Maritzburg; a preliminary investigation. South African Jour. Sci. 19: 207-217. 1922.—Marked differences exist in the character of the vegetation on the northern and southern slopes of Signal Hill. These differences are probably principally due to differences in the climatic conditions on the 2 sides of the hill and partly to differences in the soil conditions. Even in a single day the 2 slopes show marked differences in such environmental factors as sunlight intensity, air temperature, rate of evaporation, and soil temperature. The soil on the southern slope is considerably moister than on the northern. Trees of *Cussonia spicata* appear to have a greater transpiring power on the southern slope than on the northern, i.e., the trees on the northern slope have a greater power of resisting water loss.—R. D. Aitken.

2328. AITKEN, R. D. The plant succession in a type of midland tree veld in Natal. South African Jour. Sci. 18: 233-243. 2 Pl., 1 map. 1922.—Examples of the more important types of tree veld in South Africa are given, and attention is drawn to a unique feature in the establishment of tree veld,—the invasion of grassland by trees,—and to the consequent importance of a study of the succession in each type. A detailed discussion is given of tree veld termed a *Cussonia-Combretum* association, occurring on a hill near Pietermaritzburg. The topography and climate of the hillside is described and the distribution of tree veld in the immediate neighborhood indicated. The dominant grass is *Aristida junceiformis*. The main bases of colonization are a shallow central valley and another valley further east. Migration from these valleys has taken place principally towards the east, probably because the eastern sides of the valleys are moister than the western.—R. D. Aitken.

2329. ANDERSEN, EMMA N., AND ELDA R. WALKER. An ecological study of the algae of some sandhill lakes. Bot. Surv. Nebraska N. S. No. 4. 34 p., 9 pl. 1920. [Reprinted from Trans. Amer. Microsc. Soc. 39: 51-84. 1920 (see Bot. Absts. 8, Entry 99).]

2330. BEWS, J. W., AND R. D. AITKEN. The measurement of the hydrogen ion concentration in South African soils in relation to plant distribution and other ecological problems. South African Jour. Sci. 19: 196-206. 1922.—The meaning of acidity and the expression of H-ion concentration are explained, and details are given of a method of determining the H-ion concentration of a soil solution. A number of preliminary tests have been made of South African soils from the Low Veld and the High Veld. The surface soils of the former are

slightly acid or neutral, and all the High Veld soils appear to be acid, but forest soils are not so acid as those of the open grass veld.—*E. M. Doidge*.

2331. BRAY, WILLIAM L. History of forest development on an undrained sand plain in the Adirondacks. New York State Coll. Forest. Tech. Publ. 13. 47 p., 23 fig., map. 1921.—The sand plain in question is related to the Grasse River drainage channel and to Massawepie Lake and its outlet. It is physiographically similar to other sand plains referred to in the author's present and previous publications but its low elevation has led to the entrance of Sphagnum as a controlling factor in the vegetation development. A peat bed varying from a few inches to over 7 feet covers the sand. The present vegetation consists of various stages in the bog sequence characteristic of the Adirondacks. Some of these associations are secondary as there is evidence that older associations have been destroyed by fire. One section of the sand plain is occupied by very old tamarack [*Larix americana*] and black spruce [*Picea mariana*] (black spruce specimen 24 inches in diameter D. B. H.). At this point edaphic conditions and additions of balsam swamp species indicate that the bog forest is passing over into balsam swamp. The author concludes that in the Adirondacks this type is the outcome of the bog succession. Only faint indications of the regional climax forest are present. So far as forestry interests go the bog sequence ends in an edaphic climax dominated by balsam [*Abies balsamea*].—*William L. Bray*.

2332. CANNON, W. A. The influence of the temperature of the soil on the relation of roots to oxygen. Science 58: 331-332. 1923.—Increase of temperature of the soil results in diminished growth of roots unless sufficient oxygen is supplied. More oxygen is needed to supply the energy required for the increased physiological activities.—*C. J. Lyon*.

2333. GUPPY, H. B. Suggested botanical exploration of the higher summits of the Cape Verd Islands. Nature 112: 472. 1923.—The writer comments on plants which might be looked for and upon the importance of such locations in throwing light upon extinct floras.—*O. A. Stevens*.

2334. LOVELL, J. H. Plants which require an acid soil. Amer. Bee. Jour. 63: 302-303. 1923.—A brief summary is given of recent investigations on the relation of soil acidity to the distribution of plants.—*J. H. Lovell*.

2335. LÜDI, W. Ergebnisse der klimatischen Verdunstungsmessungen vom Sommer 1918 im Lauterbrunnentale und in Bern. [Results of climatic evaporation measurements during the summer of 1918 in the Lauterbrunnen valley and Berne.] [Abstract.] Mitteil. Naturf. Ges. Berne 1919: 55-56. 1919.—Continuing his experiment of 1917 by adding a new station in 1918 at Berne (alt. 520 m.), Lüdi finds agreement in the principal features when data of the 2 years are calculated. (1) During the 4 summer months, the average evaporation of water per day for Berne (520 m.) was 13.78 c.c., Lauterbrunnen (800 m.) 11.48 c.c., Mürre (1,640 m.) 14.47 c.c. (2) The daily mean averages of evaporation over 5-day periods were constant for the various stations.—*G. W. Friedrich*.

2336. MICHELL, MARGARET R. Some observations on the effects of a bush fire on the vegetation of Signal Hill. Trans. Roy. Soc. South Africa 10: 213-232. Pl. 10-12, 1 fig. 1922.—The bush fire, the effects of which are recorded, broke out on Feb. 5, 1919, and burned for 2 days, killing all the aerial parts of plants on the slope. About 3 weeks later considerable growth had taken place in *Asparagus capensis* and *Andropogon hirtus*. Shortly afterwards *Haemanthus coccineus* and a few other less notable plants were in flower. Various species of *Rhus* were putting up shoots. The early winter and spring flowering periods were characterised by an abundance of vigorous flowering shoots. These appeared at the usual time. In the majority of cases these plants possess underground storage organs. Progressive decrease in numbers and vigor of plants flowering during these periods was noted in 1920 and 1921. Suggestions are made to account for the phenomenon. The northern shaded slopes of the valleys showed a conspicuously different plant population from the southern exposed slopes during the winter months. In the summer months the contrast was not as sharply marked. This is attributed largely to the fact that in winter the sun shines on the northern slopes for a short period only of the day. During 1920 the shrubs were divided into 2 classes: (a) those of which the underground parts had survived the fire and from which new shoots arose, and (b) those which were killed by the fire and which reproduced by seed. The *Rhenoster* bush falls in class (b) and is clearly favoured by burning.—*M. R. Michell*.

2337. MÜLLER, H. Lichtmessungen zur Charakterisierung von Pflanzenstandorten. [Light measurements for characterizing plant habitats.] [Abstract.] Mittell. Naturf. Ges. Bern. 1921: 18-20. 1921.—Using Wiesner's method and Eder's light-sensitive mixture of ammonium oxalate and mercuric chloride, vegetation in deep wagon ruts was found to be richer as the value of the "Lichtgenuss," $\frac{i}{GJ}$ (relation of light absorbed to daylight) increased.

Thus when $\frac{i}{GJ} = \frac{1}{2}$, *Viola biflora* was sterile, at $\frac{1}{1\frac{1}{2}}$ it was in the flowering and fruiting stage, at $\frac{1}{1\frac{1}{2}}$ *Viola biflora* was past fruiting and *Saxifraga rotundifolia* was beginning to dominate, and at $\frac{1}{4}$ there was a rich mixed vegetation.—G. W. Friedrich.

2338. PAVILLARD, J. De la statistique en phytosociologie. [Statistics in phytosociology.] 35 p. Montpellier, 1923.—The author here discusses and criticizes the statistical methods recently devised for the study of the interrelationships of the members of plant communities. Attention is given to the frequency studies of Raunkiaer and Arrhenius, the generic coefficient of Jaccard, the "characteristics" of Braun-Blanquet, and the theories of Du Rietz. The "life-forms" of Raunkiaer are commended since they incorporate the notion of time with that of form thus giving dynamic life to a morphological concept. The biological spectra of the same author are shown to fail in some of their attempted comparisons of different communities. Finally Pavillard makes a plea for the investigation of the problems of plant sociology by less rigid and more philosophical methods.—Geo. D. Fuller.

2339. PICKETT, F. L. An ecological study of *Cheilanthes gracillima*. Bull. Torrey Bot. Club 50: 329-338. 33 fig. 1923.—This xerophytic fern owes its distribution and ability to live in such arid conditions largely to certain peculiarities of the gametophyte generation. Spores are retained in the sporangia until fall or winter and like the prothallia can survive long dry periods, but show no structural adaptations for such survival. Prothallia are dioecious, the archegonium being larger and of different shape. Prothallia survive winter conditions and even a dry summer season.—P. A. Munz.

2340. SCHONKEN, J. D. Arid regions and waste lands. Their origin and reclamation. South African Jour. Indust. 5: 495-500. 1922.—The author discusses the process of wave formation and its drying element, "idiopathic dessication." The march of siccation could be combatted by stopping all veld fires, afforestation, not over-taxing the veld, and making better roads with a perfect drainage or run-off system in South Africa.—L. J. Goldblatt.

2341. SCHRÖTER, C. The Swiss National Park. Nature 112: 478-481. 4 fig. 1923.—An area of 140 square km. was secured as a nature reserve in the Ofen district of the Lower Engadine. The greater part is leased by the state for 99 years. It is very sparsely populated, includes alpine conditions and forests of *Pinus montana* var. *arborea*, *P. cembra*, *Picea excelsa*, and *Larix europea*. *Pinus sylvestris* var. *engadinensis* and *P. montana* var. *prostrata* are present. The dividing line between the floras of eastern and western Alps passes through the region. The Schweizerische Naturforschende Gesellschaft had undertaken an investigation of the region and begun preparation of lists of species present.—O. A. Stevens.

2342. STOCKER, D. Klimamessungen auf kleinsten Raum an Wiesen-, Wald- und Heidepflanzen. [Climatic measurements on minimal areas in meadow, forest and heath plants.] Ber. Deutsch. Bot. Ges. 41: 145-150. 1923.—The author made observations on formations of the northwest plains and the German "Mittelgebirge." They give an insight into the conditions as to the temperature, moisture, and wind strength in the vicinity of the plants, and also in free atmosphere at 1.5 m. above ground. Tables of measurements of different plants in the different formations, giving height, temperature, type of vegetation, etc., are given. The factors influencing the measurements are discussed. The author compares the Calluna of northwest heath and the mountain ridges which was subjected to strong wind with that of the forest-protected Calluna of middle and south Germany with high moisture content. He observes that Calluna requires relatively high moisture.—Hally Jolivet Sax.

2343. SUNIER, A. L. J. Contribution to the knowledge of the natural history of the marine fish ponds of Batavia. Treubia 2: 157-400. 2 map, 2 diag., 75 fig. 1922.—This contribution contains a chapter (pp. 182-198) on the submerged vegetation in the Batavia marine fish ponds or empangs, tables (pp. 314-343) correlating the salinity of the ponds at different seasons of

the year with the breeding of Anophelines and submerged vegetation, and a bibliography of 65 references. The toleration for salinity is given as 3.5-60.7% for *Chaetomorpha herbi-polensis*, as 6-42.4% for *Ruppia rostellata*, and as 20-30% for *Najas fasciculata*. The occurrence of these plants and of other algae, such as *Entomorpha*, *Vaucheria*, *Spirogyra*, and certain desmids, in extremes of salinity is also noted.—Margaret B. Church.

2344. WEAVER, J. E., AND ALBERT F. THIEL. Ecological studies in the tension zone between prairie and woodland. Bot. Surv. Nebraska N. S. No. 1. 60 p., 38 fig. 1917 [1918]. This is a study of the ecological conditions, including factors, of the borderline between typical prairie and woodland areas in the Missouri valley. Lack of available soil moisture and the stress due to evaporation are cited as the principal reasons for failure of forest trees to invade the prairie under natural conditions.—R. J. Pool.

FLORISTICS

2345. DIDDELL, MARY W. Botanizing in south-east Georgia. Amer. Bot. 29: 138-142. 1923.—A brief statement of the habitat of various native species is given.—Susan P. Nichols.

2346. FORBES, HELENA. The flora of Isipingo. South African Jour. Sci. 18: 343-358. 1922.—Isipingo is a seaside resort on the Natal Coast; a list is given of plants occurring in this locality, on the sea-shore, in the mangrove swamps on the hillside, and in the bush.—E. M. Doidge.

2347. GLEASON, H. A. Review: age and area. [Rev. of: WILLIS, J. C. Age and area, a study in geographical distribution and the origin of species. x + 259 p. University Press: Cambridge, 1922 (see Bot. Absts. 13, Entry 2351).] Ecology 4: 196-201. 1923. [See also Bot. Absts. 12, Entries 4851, 5466; 13, Entry 761.]

2348. HANSON, HERBERT C. Distribution of Arizona wild cotton (*Thurberia thespesioides*). Univ. Arizona Agric. Exp. Sta. Tech. Bull. 3: 49-59. 3 fig. 1923.—This plant is important on account of being the host of a native boll weevil that has been shown to be capable of attacking cultivated cotton. The results of studies of the distribution of the host and parasite in Arizona are given.—Geo. D. Fuller.

2349. HOLLOWAY, J. E. Studies in the New Zealand Hymenophyllaceae. Part 1. The distribution of the species in Westland and their growth-forms. Trans. New Zealand Inst. 54: 577-618. Pl. 56-76, maps 1-2. 1923.—The ecological and phytogeographical aspects of many species are considered. The relation of the climatic conditions to the type of forest and the distribution of epiphytes is explained. The species of Hymenophyllaceae are grouped in relation to altitude and to the height above the ground at which they occur, as follows: (a) *Hymenophyllum dilatatum*, *H. scabrum*, and *Trichomanes reniforme* are low and middle epiphytes up to about 1,200 feet. (b) *Hymenophyllum ferrugineum* and *Trichomanes venosum* are lowland species on the stems of tree ferns or the bases of forest trees, reaching an altitude of 1,400 feet. (c) *Hymenophyllum sanguinolentum*, *H. multifidum*, and *H. villosum* occur from the lowlands to the heights, the 2nd named throughout the range while the 1st is a sea-level plant replaced above 1,200 feet by *H. villosum*, with which it is connected by intermediate forms in the middle altitudes. The 1st 2 tend to be middle epiphytes in the heights, to be high species in the gullies, while *H. multifidum* descends to the forest floor at high altitudes. *H. villosum* is limited to the higher parts of the trees. (d) *H. flabellatum*, *H. rufescens*, *Trichomanes Lyallii* and *T. rarum* form close colonies on tree bases or beneath branches on mountain flanks or in part in lowlands. They are all able to resist very considerable drought. (e) *Hymenophyllum Tunbridgensae*, *H. peltatum*, *H. Armstrongii*, *H. minimum* are small forms growing in mats. They have a wide range both in substratum and altitude, *H. peltatum* replacing *H. Tunbridgensae* at high altitudes. (f) *H. demissum* and *H. bivalve* are characteristically terrestrial, though the latter may become a low epiphyte, and are found in the hilly forests. (g) The remaining species are not associated with other types. *H. pulcherrimum* is the only New Zealand species which has a tufted growth-form. *H. Malingii* is unique in its extremely xerophytic frond. The conditions on Mount Greenland are described as an example of a mountain with considerable elevation, and the Otira gorge as a high area which has great fluctuations in dampness despite heavy precipitation due to frequent prolonged dry east winds. The growth forms of the different species are considered in relation to surrounding vegetation,

and are classified into 6 groups. The distribution of the species is discussed in its bearing on the phylogeny of the family.—*Wm. Randolph Taylor.*

2350. Спиридонов, М. Д. [SPIRIDONOV, M. D.] **Голоиная степь.** [The barren steppe.] *Acta Horti Petropol.* 35: 1-251. Pl. 1-10, fig. 1-20, maps. 192?—The barren steppe in Turkestan is situated 40° 15'-41° 18' N. Lat. and 37° 15'-38° 45' E. Long. from Pulkov. The author presents a detailed floristic description and a synoptical census of the flowering plants. The plates are excellent reproductions of photographs of certain herbarium specimens and of various plant associations, including some landscapes.—*B. Kozot-Poljanski.*

2351. WILLIS, J. C. **Age and area, a study in geographical distribution and the origin of species.** *x + 259 p., maps.* University Press: Cambridge, 1922.—In this volume the author has gathered together the results which have been published in a long series of papers on the "age and area" theory. He states this theory as: "The area occupied at any given time, in any given country, by any group of allied species at least ten in number, depends chiefly, so long as conditions remain reasonably constant, upon the ages of the species of that group in that country, but may be enormously modified by the presence of barriers such as seas, rivers, mountains, changes of climate from one region to the next, or other ecological boundaries, and the like, also by the action of man, and by other causes."—The book is divided into 2 parts, (1) the present position of the theory and (2) its applications. The first few chapters deal with the dispersal of plants into new areas, the introduction and spread of foreign plants, acclimatization, and the factors which favor or hinder dispersal. The general inference is that dispersal in nature must be an extremely slow process. A chapter is then devoted to the original evidence on which the theory is based and may be partially summarized as follows: The species which are most widely distributed in a country are those with widest distribution outside it. Dividing the species into classes according to area occupied, the endemics with the smallest areas are the most numerous and the numbers decrease steadily as the area increase, while non-endemics arrange themselves in exactly the reverse order. The conclusion is that the area occupied increases with age. The next chapter gives illustrations of the way in which the theory is confirmed by making predictions regarding what local distributions should be if the theory is correct and then verifying the predictions by an examination of the actual floras. Another chapter deals with the theory in relation to invasions of a country with special reference to New Zealand. The last chapter of Part I is devoted to meeting the numerous objections which have been raised, most of them being due to misunderstandings. —Part II opens with a consideration of a corollary of age and area which the author calls size and space. According to this the greater the number of species which a genus contains the wider is the area which it occupies. Other chapters deal with the theory in relation to endemic species, endemic genera, monotypic genera and animals. Special consideration is given to the "hollow curve" which almost always represents comparative distribution, because very many species occur on very small areas and the numbers diminish rapidly towards areas of moderate size and then more and more slowly towards areas of large size. The bearing of the theory on the origin of species is discussed at length and it is believed to support strongly the view that quite distinct mutations as opposed to infinitesimal variations constitute the important factor. Special chapters are contributed by H. B. GURRY on the general position of the theory, by MRS. E. M. REID on its palaeobotanical aspects, by J. SMALL on its application to Compositae, and by H. DEVRIES on its relation to the mutation theory. In a final chapter the author summarizes the general bearings of the book on the study of geographic distribution. [See also Bot. Absts. 12, Entries 4851, 5466; 13, Entries 761, 2347].—*W. P. Thompson.*

VEGETATION

2352. Алехин, В. В. [ALEKHIN, V. V.] **Основные черты в распределении растительности Европейской России.** [A sketch of the plant geography of European Russia.] 48 p., 2 maps. Сабашниковых: Москва. [Sabashnikov Brothers: Moscow], 1921.—This is an illustrated sketch of the distribution of plant-association types considered from the historic point of view.—*B. Kozot-Poljanski.*

2353. АЛЕХИН, В. В. [ALEKHIN, V. V.] Растительность лугов р. Вороны. [The meadow vegetation of the Voroni river.] Журнал Московск. Отделения Русского Ботанич. Общества. [Jour. Moscow Sect. Russian Bot. Soc.] 1: 28-57. Fig. 1-5. 1922 [1923].—This is a synecological sketch.—*B. Kozot-Poljanski.*

2354. DALLIMORE, W., AND J. W. MUNRO. Additions to the wild fauna and flora of the Royal Botanic Gardens, Kew. Kew Bull. 1922: 189-193. Fig. 1-6. 1922.—The botanical portion of the paper consists of notes concerning species of trees that are hosts for various bark beetles.—*T. J. Fitzpatrick.*

2355. DIDDELL, MRS. W. D. Our native *Cycas*. Amer. Bot. 29: 118-119. 1923.—A brief semi-popular description of *Zamia integrifolia* is given.—*Geo. D. Fuller.*

2356. Доктуровский, В. С. [DOCTUROVSKI, V. S.] Виды Торфа. [The varieties of peat.] Вѣстникъ торфяного дѣла. [Reports on Peat.] 3-4. Fig. 1-14. 1915 [with French summary].—The various kinds of peat in Russia and their distribution there are treated. The structure of the layers of peat in the bogs of Russia and of other countries is shown schematically on a chart. The author (at variance with Weber's definition) distinguishes between marshes (Sumpfe) and peat bogs (Torfmoore), the latter being formed exclusively of plants the roots of which do not reach the mineral substratum, while the former include all places characterized by stagnant water and water-loving vegetation. The illustrations show reeds and sedges in the various layers.—*W. Docturovski.*

2357. Доктуровский, В. С., М. Рынкевичъ, М. Копачевский, В. Хитрово, Н. Деревницкий, и Н. Троицкий. [DOCTUROVSKI, V. S., M. RYNKEVICH, M. KOPACHEVSKY, V. KHRITROVO, N. DEREVITZKY AND N. TROITZKY.] Исслѣдованія болотъ Волынской Губ. въ 1913 году. [Researches on the moors of the province of Volyn in 1913.] 110 p., 15 fig. Петроградъ. [Petrograd], 1915.—The numerous bogs of the northern portion of the province of Wolyn are here described, the western type of bog being characteristic of this region. Its outstanding characters are the grass—*Carex* association (Gramineto-Caricetum), the *Carex-Phragmites* association (Cariceto-Phragmitetum), and the *Hypnum* association (Hypnetum). They rest on sand which is underlaid with chalk (Kreis Lutzk). The sphagnum bogs rest mainly on granite and sandstone (Kreis Ovrutch).—*W. Docturovski.*

2358. GADECEAU, ÉMILE. La Grande Brière. Nature [Paris] 1923: 225-229. 1923.—The "Grande Briere" is a vast peat bog on a tributary of the Loire River in the form of a shallow lake with irregular shore and islands submerged at high water. In describing the vegetation 2 association-types are recognized: helophytic, comprising reed associations, and oxalophytic, including the Magnocaricetum dominated by *Carex stricta*, Myricetum with *Myrica gale* and associates, and Callunetum with *Calluna* and *Molinia coerulea*.—*Geo. D. Fuller.*

2359. GOODE, J. PAUL. School atlas. viii + 41 p., 96 pl. Rand McNally & Co.: Chicago, 1923.—This atlas contains a vegetation map of the world modified from Schimper and a vegetation map of the U. S. A. and southern Canada by H. L. SHANTZ, RAPHAEL ZON and B. E. FERNOW. In addition there are small maps by the author giving the distribution of native vegetation and cultivation and a soil map of the U. S. A. by C. F. MARBUT.—*Geo. D. Fuller.*

2360. HART, T. S. Botanical notes about Bairnsdale and the eastern lakes. Victorian Nat. 40: 107-116. Pl. 8 (map.).—1923.—The ecology of the district is described under the following floral subdivisions: red gum plains, lower hills, coastal hummocks, wet situations and salt marshes, limestone cliffs and main valleys. Typical plants of each of these areas are described, especially *Clematis glycinoides* DC. of the limestone cliffs, which is figured.—*Wm. Randolph Taylor.*

2361. KENOYER, LESLIE A. Waldformationen des westlichen Himalaya. [Forest-formations of the western Himalays.] Vegetationsbilder 15¹: 1-14. Pl. 1-6. 1923.—The region illustrated ranges from 1,350 to 2,100 m. altitude and from a frostless monsoon climate to one of oak and pine forests with considerable frost. All photographs are of vegetation near the Sat Valley and include (1) upper monsoon forest; (2) *Bauhinia Vahlia*; (3) *Quercus incana* forest; (4) contrast between the vegetation of a ridge and a valley; (5) *Pinus longifolia* forest, and (6) *Euphorbia Royleana*.—*J. C. Th. Uphof.*

2362. LANKESTER, C. H. A short trip on Mt. Elgon, Uganda. Kew Bull. 1922: 145-148. 1922.—The article includes a general description of the vegetation and the different types as they appear from the base to the summit of the mountain.—*T. J. Fitzpatrick.*

2363. PAULSEN, OVE. Studies in the vegetation of Pamir. The second Danish Pamir expedition conducted by O. Olufsen. 132 p., 79 fig., 1 map. Gyldendahl: Copenhagen, 1920.—The country described lies between 36 and 40°N. Lat. and 71 and 76°E. Long. Eastern Pamir is a complex of broad flat valleys divided by high mountains, the former having an elevation of 3,000–4,000 m. and the latter attaining a maximum altitude of 8,000 m. Western Pamir is characterized by mountain ridges and deep narrow valleys. The climate is continental, the mean temperature varying from -18°C . for January to $13-22^{\circ}\text{C}$. for July, frost usually occurring during every month of the year. Humidity is low and rainfall very scanty during the summer. In High Pamir the growing period is limited to July and August and vegetation is said to lend only a faint greenish hue to the landscape except along the streams and on some sheltered slopes.—Paulsen characterizes the vegetation as treeless and xerophytic, and composed largely of caespitose and suffrutescent plants in open communities. These on the broad floors of the valleys at about 4,000 m. constitute a sort of fell-field, with plants forming broad tufts and cushions often 20–30 cm. high, designated the *Trigonella* formation (association) from the most abundant plant, *Trigonella Emodi*. Of the 49 species in this most widely spread association-type, 14 are chamaephytes and 28 hemicyrptophytes, 11 are legumes belonging to *Astragalus* and related genera, while other common species are *Silene caucasica*, *Chrysanthemum pamiricum*, *Polygonum paronychoides*, *Eurotia ceratoides*, and *Acantholimon* spp. The small size of the leaves of these plants and their almost unfailling hairiness are decidedly xerophytic characteristics.—The vegetation of the mountain sides is described as often similar to that of the valley floors passing on the mountain slopes to a more mesophytic association characterized by *Arenaria Meyeri* or to a still more mesophytic alpine meadow with *Poa attenuata* and associated species. The southern slopes possess the most xerophytic vegetation, the *Eurotia* formation, with less than 20 species among which *Eurotia ceratoides* and *Stipa orientalis* are most common.—Less widely spread communities are also described from the talus slopes, the streams and stream margins, the swamp meadows, and from the vicinity of some hot springs. Finally, in the lower valleys some woody vegetation occurs in the form of willow thickets.—Geo. D. Fuller.

2364. RIKLI, M., UND E. RÜBEL. Korsika. [Corsica]. Vegetationsbilder 15: 1–18. Pl. 7–12. Jena, 1923.—A general description of the geology of Corsica is presented. The vegetation is divided into (1) the Mediterranean, in which are the zones of the olive, the macchie, and the chestnut, the last characterized by *Castanea* and containing also *Quercus ilex*, *Q. pubescens* and *Pinus pinaster*; (2) the mountain forest in which *Pinus nigra*, *Abies alba*, and *Fagus silvatica* are predominant; and (3) the alpine region above 1,800 m. The plates represent *Nerium oleander*, *Arundo donax*, *Gomphenocarpus fruticosus*, *Helleborus foetidus*, the macchie (shrub) association, *Pinus nigra Poiretiana*, *Abies alba* forest, and *Fagus silvatica* at 1,280 m. and at 1,480 m., the latter being a wind form.—J. C. Th. Uphof.

2365. SEIFRIZ, WILLIAM. The altitudinal distribution of plants on Mt. Gede, Java. Bull. Torrey Bot. Club 50: 283–306. Pl. 15–17, 7 fig. 1923.—The following regions on Mt. Gede showing transition from tropical rain forest are recognized: (1) the rasamala subzone, 4,600–5,500 feet, with a luxuriant forest characterized by the "rasamala," *Liquidambar Altingiana*, and by species of *Quercus* and *Castanea* together with more tropical forms such as *Ficus* spp., *Calamus* spp., epiphytic orchids and ferns including *Angiopteris erecta*, *Asplenium nidus*, and *Hymenophyllum* spp. and *Trichomanes* spp.; (2) the Podocarpus subzone, 8,000–9,000 feet, with a moss-covered forest containing *Podocarpus* spp., many small trees, lianas, and ferns; (3) the herbaceous subzone, 7,000–8,000 feet, with a more open forest leading to abundance of herbaceous vegetation; (4) the *Vaccinium* subzone, 8,000–9,000 feet, containing many of the same trees reduced in size and *Vaccinium* spp. appearing as trees, shrubs, and lianas well covered with mosses; (5) the edelweiss subzone, 9,000–9,400 feet, characterized by the Japanese edelweiss, *Anaphalis javanica*, and the small tree, *Albizia montana*.—P. A. Munz.

2366. SMITH, H. Vegetationen och dess utvecklingshistoria i det centralsvenska högfjällsområdet. [Vegetation and the history of its evolution in the high mountain district of central Sweden.] Norrländskt Handbibliotek Vol. 9. 238 p., 41 fig., 2 map. Upsala, 1920.—The district treated consists of southwestern Jämtland and northwestern Härjedalen. The altitude of the timberline in the district is dependent in the first place on the climate, and in

general the timberlines increase in altitude as the climate changes from the maritime to the continental type. To reconstruct the history of migration in the central Swedish mountains it is necessary to build on the fossils discovered. The species found are few, but they evidently prove the hypothesis, that a more or less rich flora has survived the so called Mecklenburgian ice-period at places of refuge in south Norway. During the warm epoch they were limited to the alpine tops. High (200-300 m.) above the present timberline there reigned a sylvan and sub-alpine vegetation in which were included heat-loving species now partly extinct in these regions. Since the change of climate the spreading of the alpine flora has continued with increasing intensity. From chapter 5, are made the following abstracts: *Poa hxrjedalica* is described as new with Latin diagnosis. It is always viviparous and has arisen from *Poa alpina* \times *pratensis*. The following hybrids are recorded: *Carex Goodenowii* \times *rufina*, *C. juncea* \times *rufina*, *Luzula arcuata* \times *spicata*, *L. confusa* \times *spicata*; *Orchis cruenta* \times *maculata*, *Draba incana* \times *rupestris*. *Saxifraga tenuis*, with Latin diagnosis, is proposed as new, based on *S. nivalis* β . *tenuis* Wahlenberg. *Alchemilla Wichuræ* is regarded as distinct from *A. acutidens*. The true *Euphrasia latifolia* (like the Labrador plant) is found neither in Sweden nor Norway, but the forms so named and in some respects approaching this plant should be referred to *E. minima*. *Hieracium macrocarpum* H. Persson is described as new.—P. A. Rydberg.

2367. SOWERBY, ARTHUR DE CARLE. *The naturalist in Manchuria*. 347 p., 29 pl., 1 map. Tientsin Press: Tientsin, 1922.—This is an account of travel and adventure with much information on the animal life of the region. It contains a general description of some primeval forests of *Pinus*, *Picea*, *Abies*, *Quercus*, and *Juglans* with illustrations of a few plants.—Geo. D. Fuller.

2368. UPHOF, J. C. *Vegetationsbilder aus Florida*. [Illustrations of Florida vegetation.] *Vegetationsbilder* 15⁴: 1-16. Pl. 13-24. 1923.—A description of the flora, general geology, and meteorology of Florida is presented. Various plant associations of different regions and soils are described. The plates represent forests of *Pinus echinata*, of *P. palustris*, of *Quercus virginiana*, of *Q. virginiana* and *Sabal palmetto*, swamp forests of *Taxodium* and *Nyssa biflora*, forests of the tropical type, including *Ficus aurea* and *Zamia Floridana* and a general view of the Everglades.—J. C. Uphof.

STRUCTURE, BEHAVIOR, SYMBIOSIS

2369. ROUPPERT, KAZIMIERZ. *Mrówkosiewność lulecznicy (Scopolia carniolica)*. [Dissemination of *Scopolia carniolica* by ants.] *Acta Soc. Bot. Poloniae* 1³: (1-4.) Fig. 16. 1923.—The author reports that the seeds of *Scopolia carniolica* are luminescent and considers it probable that ants are in consequence attracted. Also, the abundant fats and reducing sugars in the epidermal cells of the seed are believed to attract visitors.—J. R. Schramm.

2370. VAN OYE, PAUL. *Zur Biologie der Kanne von Nepenthes melampsora Reinw.* [Ecology of the pitchers of *Nepenthes melampsora*.] *Biol. Centralbl.* 41: 529-534. 1921.—The author gives a list of organisms found living normally in the pitchers of *Nepenthes melampsora* including 1 blue-green alga, 1 desmid, 6 species of diatoms, 6 rhizopods, nematodes, Acarineae, Podurineae, Diptera, and larvae of Diptera and Lepidoptera. Van Oye rejects the view of Jensen and Günther that organisms living in the enzyme-carrying fluid of *Nepenthes* pitchers are protected against the digestive action of this enzyme by an "antiferment," their case being comparable to that of parasitic worms in the alimentary tract of higher animals. Rather are we dealing here with a normal association of organisms, a "biocoenosis" in which the several member organisms show a common adaptation to the conditions of the habitat and perhaps as in other biomes are more or less dependent upon or influenced by each other in the course of the biomic cycle. The author describes a new species of amoeba, *Amoeba nepenthesi*, related to *Amoeba guttula* Duj. found in *Nepenthes* pitchers.—William L. Bray.

2371. VUYCK, L. *Over de betrekkingen tusschen bloemen en hommels in Nederland*. [The relation between flowers and bumble bees in the Netherlands.] *Nederland. Kruidk. Arch.* 1922: 96-148. 1922 [1923].—Flower pollination by species of the genera *Bombus* and *Psithyrus* has been observed in a large number of species.—J. C. Th. Uphof.

APPLIED ECOLOGY

2372. BERCAW, G. W. Honey plants and fruit bloom. York's Bees and Honey 4: 55-56. 1923.

2373. BEUHNE, F. R. The honey flora of Victoria. 148 p., 70 fig. Dept. Agric.: Victoria, 1922.—In this volume, prepared by the Government Apiarist, there are described 64 species of *Eucalyptus*, 5 of *Banksia*, 6 of *Leptospermum*, 13 of *Melaleuca*, 9 of *Callistemon*, and 4 of *Xanthorrhoea*. The Eucalypti, which furnish the larger part of the honey produced in Australia, are divided into 7 groups chiefly according to the characters of the bark. The most valuable nectar-yielding tree in Victoria is the yellow box (*Eucalyptus melliodora*). The honey is pale straw-colored, very dense, with an aromatic odor and a pronounced flavor.—J. H. Lovell.

2374. BOGGS, NEWTON. Honey regions of Colorado. Amer. Bee Jour. 63: 283-284. Fig. 1-3. 1923.—According to its physical features Colorado may be divided into 3 natural sections: (1) the eastern Great Plains, either level or rolling, with an immense area under irrigation where thousands of acres of cultivated alfalfa and sweet clover furnish most of the surplus honey; (2) the center of the State, traversed by the Rocky Mountains and the San Luis Valley in the south central part of the state. The principal honey plants are alfalfa, sweet clover, and the Rocky Mountain bee plant (*Cleome serrulata*), but they do not at present cover a large area. This region awaits the progressive beekeeper. (3) The Western Slope or Colorado Plateau, containing the largest streams in the state. Irrigated alfalfa and sweet clover furnish a nearly continuous flow of nectar during the entire season, first from the alfalfa in the valleys and later from the fields on the mesas. The valleys of the Colorado, Gunnison, Uncompaghere, and other rivers of this section comprise the principal fruit-growing areas of the State. The northwestern region is as yet undeveloped and contains few bees. In addition to alfalfa and sweet clover, valuable honey plants are *Grindelia squarrosa*, *Acer glabrum*, *Astragalus caryocarpus*, *Ribes irriguum*, *Rubus deliciosus*, *Oreocarya virgata*, and *Cleome serrulata*.—J. H. Lovell.

2375. CORY, E. N. Maryland beekeepers by the way. Amer. Bee Jour. 63: 236-238. Fig. 1-4. 1923.—Maryland is not well adapted to commercial beekeeping as it has no very reliable honey flow except in the Piedmont section, where the tulip-tree is abundant, its flowers secreting nectar very freely; but, as the honey flow comes early in May, the colonies of bees are seldom strong enough to gather more than a part of the nectar. Clover yields a good crop of honey about 1 year in 3, but a small quantity is obtained every year. Brief descriptions are given of the apiaries and of the results obtained by many of the more prominent beekeepers of Maryland.—J. H. Lovell.

2376. DAVIS, J. J. The relation of the honey-bee to agriculture. Amer. Bee Jour. 63: 120-122. Fig. 1-3. 1923.—The services of insects, especially of the honey-bee, in the pollination of fruit bloom are popularly described.—J. H. Lovell.

2377. DEMUTH, G[EO]RGE, S. Temperature and nectar secretion. Gleanings in Bee Culture 51:582. 1923.—In northern Indiana it was found, from 10 years' observations, that nectar became visible in the flowers of basswood [*Tilia*] at temperatures slightly above 64°F. Bees immediately discovered its presence even as early as 4 in the morning.—J. H. Lovell.

2378. HARMELING, S. J. No. 1. The honey flora of the Puget Sound country. York's Bees and Honey 4: 8-9. 1923.—In March *Salix sitchensis* and *S. scouleriana* yield honey and pollen while later in the season a surplus may come from *Acer macrophyllum* and *A. circinatum* and from various species of *Vaccinium*, from *Arbutus Menziesii*, *Arctostaphylos uva-ursi*, *Ledum latifolium* and *L. glandulosum*.—J. H. Lovell.

2379. HARMELING, S. J. No. 2. The honey flora in the Puget Sound country. York's Bees and Honey 4: 24-25. 1923.—On Mercer Island cascara sagrada (*Rhamnus purshiana*) yields a medicinal honey. *Ceanothus velutinus*, *C. prostratus*, known as Mahala mats, *Berberis aquifolium*, the Oregon grape, and several species of *Rubus* are also important honey plants. The most valuable native honey plant is *Epilobium angustifolium*, covering thousands of acres in the foothills of the Cascade and Olympic Mountains. *Solidago californica* and *S. elongata* and *Aster radulinus* and *A. chilensis* are spreading in fields and along roadsides. A large part of the surplus is gathered from white and alsike clover. Both spring and winter vetches are good honey plants, but the nectar is secured from extra-floral nectaries,—the flowers having long corolla tubes.—J. H. Lovell.

2380. HARMELING, S. J. No. 3. The honey flora of the Puget Sound country. York's Bees and Honey 4: 39. 1923.—Valuable common honey plants are the mustards, dandelion, heartsease, cat's-ear, and hawkweed. There is a light honey-flow for practically 10 months in the year, but to obtain a surplus very strong colonies are necessary. There are many opportunities for locating colonies profitably in the mountain valleys.—J. H. Lovell.

2381. JAGER, FRANCIS. Honey regions of Minnesota. Amer. Bee Jour. 63: 65. Fig. 1-3. 1923.—For beekeeping the State may be divided into: (1) the southeastern section, once covered with deciduous forests, known as the "Big Woods," now dotted with cities and villages. Here honey plants are clovers, basswood, fruit trees, berry bushes, dandelion, golden-rods and asters. Beekeepers are numerous, the honey season is from June 15 to July 25, and 100 pounds per colony may be regarded as the expected surplus. (2) The northeastern section of cut-over coniferous forests, which is best adapted for honey production, has soils rich in lime and produces luxuriant clovers, *Epilobium angustifolium*, and later a strong growth of raspberry. It is not unusual to harvest from each colony 200 pounds of white honey of fine body and flavor. (3) The western prairie lands where yields of 50-150 pounds per colony may be expected. A surplus of aster honey may be stored in September.—J. H. Lovell.

2382. LOVELL, J. H. Classification of flower odors. Amer. Bee Jour. 63: 392-394. Fig. 1-4. 1923.—A chemical classification of flower odors is at present not practical. For popular use a division into 8 artificial groups, adapted from the classes proposed by Swaardmaker, seems most satisfactory. A. Agreeable odors: (1) sweet flower odors; (2) fruit odors; (3) aromatic or spicy odors; (4) musk odors. B. Strong and rank odors: (5) onion or alliaceous odors; (6) rank odors. C. Repulsive odors: (7) foul odors; (8) nauseous odors. The various species of a genus often differ widely in their odors, as in the genera *Rosa* and *Clematis*. Many orchids exhale different odors in the morning and in the evening, as *Dendrobium glumaceum*, which has the fragrance of the lilac in the morning and of heliotrope in the evening. There is no satisfactory evidence that the honey-bee smells odors not perceptible by man. Numerous examples are given under each of the above groups.—J. H. Lovell.

2383. LOVELL, J. H. Odors and the insect visitors of flowers. Amer. Bee Jour. 63: 450-452. Fig. 1-2. 1923.—Many species of plants have the foliage strongly scented, and more rarely roots, stems, and seeds are odoriferous. The fronds of a number of ferns, and the leaves and stems of many anemophilous grasses emit fragrant odors. There is little evidence that odors are an advantage to the leaves of plants, or repel herbivorous animals. Were flower odors an advantage as an allurement to insect visitors they would be likely in time to become more intense. White flowers are most often odorous, then follow red, yellow, blue and green in the order named. Certain flowers emit odors either by day or night. Flowers pollinated by bees and butterflies are usually pleasantly odorous, while flowers with nauseous odors are attractive to flesh or carrion flies and beetles.—J. H. Lovell.

2384. LOVELL, J. H. Relation of the sense of smell to the odors of flowers. Amer. Bee Jour. 63: 335-337. Fig. 1-4. 1923.—The distribution of the sense of smell among animals and the conditions under which it is stimulated are reviewed. Bees, ants, flies, moths and many other insects have an acute sense of smell, which, according to Wheeler, Forel and v. Frisch, is located on the antennae. While there has been much discussion of the colors of flowers and their relation to the honey-bee, the significance of the odors of flowers has been almost wholly ignored. Little is known about the influence of floral odors on the flight and behavior of bees while gathering nectar and pollen.—J. H. Lovell.

2385. LOVELL, J. H. Vision of the bee. Amer. Bee Jour. 63: 74-75. 1923.—According to F. K. Richtmyer [see Bot. Absts. 12, Entry 4856] flowers in general reflect very little ultraviolet light. "Certain types of yellow flowers seem to be exceptions, the most notable of these being the ordinary wild golden glow." In view of the above observations doubt is expressed of the assertion that ultraviolet light is visible to the honey-bee.—J. H. Lovell.

2386. MACKAY, B. B. Beekeeping in Louisiana. Gleanings in Bee Culture 51: 600-601. Fig. 1. 1923.—Beekeeping in Louisiana began with the Arcadian exiles, who settled in this state 200 years ago. There is an almost continuous flow of nectar from early in January to December 15. Apiaries located near large swamps, bayous, or streams produce great crops of honey season after season. In the Atchafalaya region an apiary of 500 colonies produced 135 barrels of honey.—J. H. Lovell.

2387. PELLETT, F. C. **Beekeeping in North Dakota.** Amer. Bee Jour. 63: 115-117. Fig. 1-4. 1923.—There has been little beekeeping until recently because there were very few honey plants. Sweet clover is now abundant over large areas. There are miles of wheat fields where sweet clover covers the ground as soon as the wheat is cut. Individual colonies produce 300-500 pounds of honey, and an average production per colony of 50-200 pounds is obtained. It is estimated that 2 acres of white sweet clover (*Melilotus alba*) support 1 colony.—J. H. Lovell.

2388. PELLETT, F. C. **Honey from soy beans.** Amer. Bee Jour. 63: 20-21. 1923.—*Glycine hispida* was brought to America from Japan by the Perry expedition, and the seed were distributed by the Patent Office in 1854. Information concerning its value as a source of nectar is meagre. At Tyner, Tennessee, bees work freely on the bloom but do not store a surplus. But at Washington, North Carolina, a strong colony of Italian bees stored over 100 pounds of honey in 40 days. The honey is light colored, rather thin in body, and has a pleasant flavor, but granulates quickly. The bloom appears to secrete nectar erratically.—J. H. Lovell.

2389. PELLETT, F. C. **Sow-thistle as a honey plant.** Amer. Bee Jour. 63: 77-78. Fig. 1. 1923.—*Sonchus arvensis*, abundant in the grain fields of Manitoba and North Dakota, is reported to yield in August an inferior amber-colored honey of pronounced flavor.—J. H. Lovell.

2390. PHILLIPS, E. F. **The honey crop from introduced plants.** Ecology 4: 180-182. 1923.—A brief examination is made upon the theory of the mutual modification in structure of insects and flowers, particularly honey bees and nectar-producing plants. It would seem that little support for the idea of organic evolution can be obtained here for the honey bee is not native to America and yet works on several species of plants which were not native to places where it was originally found. About half the yield of honey in this country comes from plants native here.—J. W. Crist.

2391. PHILLIPS, E. F. **What of the future?** Gleanings in Bee Culture 51: 34-36. 1923.—The beekeeping problems of the future are briefly considered. The nectar resources of the U. S. A. are to-day greater than ever before. Fifty years ago there were no vast areas of alfalfa, alsike and sweet clover. While there has been a decrease in certain sources of nectar, especially of trees, as basswood and tulip-tree, this loss has been more than offset by the increase in cultivated trees and herbaceous plants which secrete nectar. The artificial increase in nectar resources through the agricultural use of plants valuable to the beekeeper will furnish support to many more colonies of bees in the future.—J. H. Lovell.

2392. POWELL, R. **Breeding better bees.** Gleanings in Bee Culture 51: 42-43. 1923.—Colonies of honey-bees vary greatly in the distance the bees travel in search of nectar. In 1 locality in southern California the bees failed to find an orange grove in bloom only $1\frac{1}{2}$ miles away; in another, near Redlands, they stored a surplus from orange groves 7 miles distant.—J. H. Lovell.

2393. SCHOTT, L. A. **Bee pasture in southwest Missouri.** Amer. Bee Jour. 63: 186. 1923.—Here in 1922 within a radius of 2 miles there were 400 acres of watermelons and 200 of cantaloupes. Mellon honey has a heavy body, fine flavor and is whiter than white clover honey, almost transparent. Cow-pea (*Vigna sinensis*) is also a good honey plant in this section, though it does not always secrete nectar. Nectar is gathered from extra-floral nectaries on the peduncles. The honey is bluish and has a pronounced bean flavor until it has ripened. Other common honey plants are willow, persimmon, dandelion, red-bud, fruit-bloom, white clover, boneset, heartsease, goldenrod, and aster.—J. H. Lovell.

2394. SECHRIST, E. L. **Beekeeping in Haiti and the Dominican Republic.** Amer. Bee Jour. 63: 167-170. Fig. 1-4. 1923.—The best honey-producing districts in Santo Domingo are the semi-arid regions on the north and south sides of the island, which have a climate similar to southwestern U. S. A. Valuable nectar-yielding plants are *Prosopis juliflora*; logwood (*Haematoxylon campechiana*), with fragrant yellow bloom, yielding a delicious white honey of which a single colony of bees have been known to store 700 pounds in a season; and the campanillas (*Ipomoea sidaefolia* and *I. triloba*). Torrential rains, intervals of drought and differences in amount of rainfall in adjacent regions are important factors that determine the success of the beekeeper to a greater extent than in the U. S. A.—J. H. Lovell.

2395. SECHRIST, E. L. Tropical beekeeping. Amer. Bee Jour. 63: 440-441. Fig. 1-4. 1923.—The development of commercial beekeeping in the U. S. A. has been largely dependent upon the cultivation of large areas of clover, buckwheat, alfalfa, cotton, and orange. In the tropics honey comes almost wholly from shrubs, trees, and woody vines rather than from herbaceous plants. It is difficult to obtain honey of the finest quality unmixed with darker grades of poor quality. Almost every tree yields nectar, but the time of blooming is so long that inferior nectar is often gathered from scattered trees. For this reason good localities for commercial honey production are rare. In the tropics there may be several successive short honey-flows.—J. H. Lovell.

2396. SHEPPARD, W. J. Sources of honey in British Columbia. Amer. Bee Jour. 63: 308. 1923.—On the lower mainland in the wet belt *Acer macrophyllum* and *A. circinatum* are common and usually yield a surplus. White and alsike clovers may fail to secrete nectar; *Epilobium angustifolium* on the other hand is very reliable. In the Fraser Valley the woolly Labrador Tea (*Ledum groenlandicum*) and salal (*Gaultheria Shallon*) are considered valuable. In the dry section alfalfa yields well. Other honey plants are *Symphoricarpos racemosus*, *Eleagnus argentea*, and *Arbutus Menziesii*.—J. H. Lovell.

2397. STEVENS, O. A. Honey-bees and red clover. Amer. Bee Jour. 63: 354. 1923.—Honey-bees have been reported as biting holes in the flowers of red clover, alfalfa, garden columbine, etc., but such cases are comparatively rare. Usually they use the holes made by bumble bees.—J. H. Lovell.

2398. TOURNEUR, N. Honey from Hymettus. Gleanings in Bee Culture 51: 43. 1923.—“The honey of Hymettus is the oldest known and the finest. Not even the honey of Narbonne, limpid as a crystal stream, can be compared with it.” Hymettus, a famous mountain in Attica about two miles from Athens, is covered with sweet aromatic herbs, as broom, flowering sage, lavender, thyme, marjoram, dittany, germander, basil, savory, mint, pennyroyal, rosemary and many others.—J. H. Lovell.

2399. WILDER, J. J. A delightful trip. Dixie Beekeeper 5⁹: 3-5. 1923.—Throughout the north central portion of Florida on the high pine land there is an extensive growth of *Cassia Chamaecrista*. The flowers are nectarless, but a sessile gland on the upper side of the petiole secretes nectar so freely that during the night it runs down the stem to the ground. The flow lasts from August until October, but it is impossible for the bees to gather all the nectar.—J. H. Lovell.

2400. WILDER, J. J. Spring titi. Dixie Beekeeper 4: 11. Fig. 1-2. *Cliftonia monophylla* in southeastern Georgia forms dense thickets, taking complete possession of the land, along all the small streams. The honey-flow extends from early February to late March. It is the first great commercial honey plant to bloom.—J. H. Lovell.

2401. WILSON, H. F. Honey regions of Wisconsin. Amer. Bee Jour. 63: 223-226. Fig. 1-3. 1923.—Beekeepers include Wisconsin in the clover region, as the greater part of the surplus of honey comes from white and alsike clovers.—Eight beekeeping regions are recognized on more or less artificial lines. The southeastern, southern and southwestern sections of the state (regions 1, 5 and 2) have a very fertile soil, as the underlying rock is limestone, and support a luxuriant growth of white and alsike clovers. At Madison the honey flow begins about June 10 and lasts 4-6 weeks. In the southeastern region the acreage of sweet clover is sufficiently large to yield a surplus. Along the Mississippi River and on the adjacent hills there are still many basswood trees, but nectar secretion is uncertain and a surplus is obtained only once in 3-4 years.—The lower central section (regions 3 and 4) has a sandy acid soil. Fewer bees are found in this area than in any other; but it is the principal buckwheat-producing region. The honey flow starts about August 1 and continues for several weeks.—On the central west border there is a small area (region 7) in which the conditions are nearly similar to those in the southwestern region; clover and basswood are abundant; but the location is more favorable as it is farther north.—In the northern half (regions 6 and 8) beekeeping is largely undeveloped. The climate is ideal for clover and nectar secretion, the nights being cool and the days warm. Honey plants more or less widely distributed are maple, dandelion, golden rod, asters, raspberry, fruit-trees and fireweed. Recently dandelion has been very abundant, beekeepers northward not uncommonly obtaining a surplus of 25 pounds per colony.—J. H. Lovell.

2402. WITTE, HERNFRID. The peat bogs of Sweden and the Swedish peat society. 24 p., 10 fig. H. Halls Jönköping, [Sweden] 1924.—The area of peat land in south and central Sweden is 8.4% of the entire surface of the country while in north Sweden it reaches 30% of the total area. The peat society has established an experiment station at Jönköping, and 2 experimental farms for the scientific study of these peat areas with particular emphasis on their soil and vegetation with a view to the better economic use of this large proportion of the land.—*Geo. D. Fuller.*

FOREST BOTANY AND FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 2150, 2174, 2207, 2216, 2295, 2310, 2328, 2331, 2344, 2361, 2365, 2367, 2368, 2603, 2625, 2639, 2646, 2776, 2780, 2783, 2795, 2796, 2805, 2822, 2837, 2839, 2906, 3107, 3153, 3164, 3180, 3192, 3206, 3212)

2403. ANONYMOUS. Exposition de motivos que funda el proyecto de la ley forestal y de arboledas. [Basic principles of the proposed forest law.] México Forest. 1^o: 10-17. 1923.—Mexico had no federal legislation providing for the conservation of forest resources previous to the 1917 Constitution, although the need for such conservation was great. In accordance with the new constitution, such a law has now been proposed. It recognizes 4 classes of ownership: federal, municipal, communal, and private. All vacant federal lands not suited for agriculture are to be declared permanent forest reserves, using forest in the broad sense to include range land, brush, and chaparral, as well as timber forest. There are at least 20,000,000 hectares of such land. The national forests are to be administered by a Forest Service under the Department of Agriculture and Industry, which is also to supervise the administration of municipal and communal forests. Private owners in "protection zones" must submit to federal regulation, under penalty of expropriation, together with higher taxes than those paid by other owners (special exemptions may be granted to owners practicing forestry). Planting stock is to be furnished free or at cost to owners for reforesting denuded land, and there are special provisions for encouraging tree planting near towns and cities.—*W. N. Sparhawk.*

2404. ANONYMOUS. Forstwirtschaft und Waldweide. [Forest management and grazing.] Zeitschr. Forst.- u. Jagdw. 54: 511-512. 1922.—Because of the shortage of fodder during and since the war, cattle have been allowed to graze in the forests more or less continually; foresters are now urging that the practice be stopped.—*J. Roesser.*

2405. ANONYMOUS. History and description of Cyprus forests and plantations. Cyprus Agric. Jour. 18: 99-101. 1923.—The author gives a brief history of the first forestry operations on the Island and a description of the first successful plantation, which was made on very sandy land covering 367 acres.—*W. Stuart.*

2406. ANONYMOUS. Money in timber growing. South African Fruit Grower 10: 110-112. 9 fig. 1923.—*Eucalyptus saligna* may be profitably grown in conjunction with the citrus farm. This wood is eminently suitable for the manufacture of orange boxes.—*L. J. Goldblatt.*

2407. ANONYMOUS. Proyecto de ley forestal y de arboledas. [Proposed forest law.] México Forest. 1^o: 1-8. 1923.—This is the text of the proposed law.—*W. N. Sparhawk.*

2408. ANONYMOUS. Second annual report of the Forestry Commissioners, year ending September 30, 1921. [Great Britain] Forestry Commission Ann. Rept. 44 p., 1 map. 1922.—The year's progress in acquisition of land and in forest planting is given in detail, for England and Wales, Scotland, and Ireland, together with statements of expenditures and work accomplished under these heads and under general organization, forestry operations, nurseries, education, research, advisory service, and special services (including publications, woodland census, and exhibits). Research projects included permanent sample plots for determining rates of growth and yields, studies in various phases of nursery practice and planting procedure, investigation of peat soils in relation to tree growth, and study of insect pests.—The outstanding feature of the year was the drought, which in most of England and Wales was the worst in over 70 years. This, with abnormally high temperatures and drying winds, was

largely responsible for the death of 35% of the trees planted.—Imports of timber, wood pulp, and manufactures of wood for 1920 and 1921 are compared with average imports for 1909–13 and 1914–18.—*W. N. Sparhawk.*

2409. ANONYMOUS. **Some sources of commercial timber.** The potentialities of Kenya, Uganda and Tanganyika. *South African Jour. Indust.* 6: 411–417. 1923.—The article, prepared from the recently published report of the delegation sent to these territories by the Union Government, deals with the timber resources and the prospect of obtaining railway sleepers for South Africa.—*L. J. Goldblatt.*

2410. ANONYMOUS. **The artificial seasoning of wood.** A note on the ozone process. *South African Jour. Indust.* 6: 131–132. 1923.—The different artificial processes of wood seasoning are discussed. None is capable of producing the same results as natural seasoning, except the Otto ozone process, which in a few days produces seasoned wood in no way distinguishable from wood air-dried for 10 years.—*L. J. Goldblatt.*

2411. ANONYMOUS. **Third annual report of the Forestry Commissioners, year ending September 30, 1923.** [Great Britain] *Forestry Commission Ann. Rept.* 38 p., 1 map. 1923.—The year's accomplishments in the several phases of the forestry program are detailed [see Bot. Absts. 13, Entry 2408], with the customary financial statements. The original program was modified somewhat because of the necessity of curtailing expenditures, although grants from the Unemployment Fund relieved the situation somewhat. The relation of forestry to rural employment is pointed out, and it is estimated that a forest fully developed on a sustained yield basis will afford full-time employment at the rate of 1 man for each 40–50 acres. Imports of timber, wood pulp, and wood manufactures are shown for 1921, 1922, and averages for 1909–13 and 1914–18.—*W. N. Sparhawk.*

2412. ALLEN, E. T. **America's transition from old forests to new. IV. The future.** *Amer. Forest.* 29: 307–311. 6 fig. 1923.—It is predicted that interest in reforestation will move eastward as the East and South better realize the advantage of a home-grown timber supply. In the West, closer utilization will develop with the growing market for low-grade material. Better manufacture, the saving of by-products, and the invention of new forms of wood utilization will come about as the character of the forest changes from a mine of virgin timber to a crop of younger growth. Secondary wood-working establishments will be located near permanent supplies in order to reduce transportation costs of raw materials. The combined efforts of nation, states, and individuals will keep a proper proportion of the land in forest.—*Chas. H. Otis.*

2413. BATES, C. G. **Planting in the national forests.** *Sci. Monthly* 17: 609–616. 1923.—Best results have been obtained with some species of *Pinus* on light soils. In many localities where seeding has failed the proper nursery stock will be successful. Usually native and well tried species are now used. Forest planting is mainly beyond the experimental stage. The rate of planting should be increased in order that several million acres of barren land may be quickly placed on a productive basis.—*L. Pace.*

2414. BEAN, W. J. **The big tree of Tule.** *Kew Bull.* 1922: 199–201. 1922.—This tree, *Taxodium mucronatum*, is in the churchyard of Santa Maria de Tule, about 18 miles southeast of Oaxaca, Mexico. It has a trunk diameter of 50 feet and a height of 150 feet. Its age is estimated to be 5,000 years. The present condition of the tree is excellent.—*T. J. Fitzpatrick.*

2415. BEVAN, W. **Acamas forest.** *Cyprus Agric. Jour.* 18: 83. 1923.—The Acamas forest, one of the less known forests of the Island, is 23 square miles in extent. Few trees of large size are to be found.—*W. Stuart.*

2416. BISHOP, L. L. **Pines of Hearts Content.** *Amer. Forest.* 29: 361–363. 6 fig. 1923.—A forest of approximately 600 acres in Warren County, Pennsylvania, is described. It constitutes the last extensive stand of original, old-growth, white pine in the East. It is hoped that the area may be preserved.—*Chas. H. Otis.*

2417. BOUQUET DE LA GRYE, A. **La surveillance des forêts et de la pêche.** [The supervision of forests and fisheries.] 12th ed. revised by CH. GUYOT. 350 p. Librairie Agricole de la Maison Rustique: Paris, 1922.—This manual of instructions for French forest officers describes in detail their duties and privileges.—*W. N. Sparhawk.*

2418. BROWN, N. C. **The forests of Czechoslovakia.** *Amer. Forest.* 29: 431–434. 4 fig. 1923.

2419. CHANNER, F. F. R. Annual progress report of forest administration in the United Provinces for the period 1st April 1921 to 31st March 1922. 36 + lxxiii + 3 p. Allahabad, 1922.—The report details the work of the Forest Department, with a summary by the Secretary to the Government. Good progress is being made in preparing working plans on 2,510 square miles of forest. Incendiary fires were numerous, and fire protection was only 77% successful, 863 square miles having been burned. While natural reproduction of sal is not satisfactory, the results of management show a progressive improvement. Silvicultural operations were carried out on 40,380 acres. Much research was done, especially in concentrated regeneration of sal. Where demonstration plantations have been set out on waste lands, the people willingly coöperate in extending the work. Financially the year shows a surplus of 12.5 lakhs of rupees, a decrease of 3.5 lakhs, due to capital investment in transportation and wood utilization equipment.—*S. B. Show.*

2420. COPE, J. A. Loblolly pine on the "Eastern Shore." Amer. Forest. 29: 368-371. 10 fig. 1923.—The growth, culture and importance of loblolly pine on the Maryland Coastal Plain are discussed.—*Chas. H. Otis.*

2421. COVENTRY, B. O. Progress report of forest administration in the Jammu and Kashmir State for thd year 1920-21 A. D. (Sambat 1977). ii + 27 + lxxvi p. Lahore, 1923.—The report details the work of the Forest Department. The area of state forests decreased by 321 square miles to a total of 9,393 square miles. Fire protection was less successful than in the preceding year. Natural reproduction was generally poor. Plantations increased from 1,853 acres to 2,649 acres, chiefly for firewood. The principal methods of working are selection and improvement cutting. Minor produce, such as resin, kuth, birch bark, and belladonna, was an important source of revenue. The net surplus for the year was Rs. 10, 74,000. Inadequate personnel hampered the work seriously. Detailed tabulations covering the work are included.—*S. B. Show.*

2422. D., S. K. Modifications of Von Mantel's formula. Indian Forester 49: 497-503. 1923.—The author discusses and answers statements made in a controversy over what should be included in this old formula.—*E. N. Munns.*

2423. DENZIN. Die Zerlegung der Mischbestände nach Teilflächen. [The division of mixed stands according to area occupied by the species in mixture.] Zeitschr. Forst.- u. Jagdw. 54: 401-425. 1922.—This concludes the controversy between Denzin and Trebeljahr over the Prussian working plan instructions (B.R.A.) of 1912 which Denzin supports, as against the supplementary instructions (E.B.R.A.) of 1919. The author asserts that it is an economic mistake to consider only the principal species in a mixture in determining the rotation. The choice of the principal species is important in preparing working plans under Trebeljahr's system, but Denzin asserts that this selection is not always easy. Furthermore, the errors in determining age class representation compensate each other under the B.R.A. experience, while with the other method they are cumulative, especially when similar stands are frequently dealt with.—*J. Roesser.*

2424. DETWILER, S. B. Spare the currant and spoil the pine. Amer. Forest. 29: 337-340. 5 fig. 1923.—This is a popular article on white-pine blister rust, its destructiveness and its control.—*Chas. H. Otis.*

2425. DIAZ, EDUARDO GARCIA. Industrias forestales. La fabrication del papel. [Paper making.] México Forest. 1^o: 15-16. 1 pl.; 1^o: 16-17. 1923.

2426. DUCAMP, ROGER. L'aménagement des forêts coloniales. [Management of colonial forests.] Rev. Bot. Appl. et Agric. Coloniale 2: 249-253. 1922.—The writer points out the difficulty of satisfying both the exponents of forest conservation and those who advocate immediate exploitation, but maintains that a reasonable forest policy should appeal to both classes. The Forest Service of Indo China has adopted a compromise policy permitting exploitation in certain isolated regions, but imposing restrictions in more thickly populated districts.—*Paul Russell.*

2427. DUESBERG. Wirtschaftsgrundsätze der Oberförsterei Mützelburg. [Management principles in the forest range of Mützelburg.] Zeitschr. Forst.- u. Jagdw. 54: 522-533. 1922.—Before 1889, the silvicultural system in the Mützelburg consisted in clear cutting for the primary yield, with the so-called "Sammelhieb," a thinning removing only dead stems.

Trametes pini and a fungus (Kienzopfpilz) causing stag-headedness in pine were very prevalent. Under the new management the removal of diseased trees was put first. This cutting included an every increasing portion of the main yield, while the planned clear cuttings remained more and more uncut. Although it soon was seen to be useless to fight the fungus causing stag-headedness, the forest personnel were able to remove trees infested with *Trametes pini* before the first fruit bodies appeared. The success of this thinning system is indicated by the general increase in height growth and in vigor of growth; infested trees have become scarce; the "Kienzopfpilz," while still causing premature removals, has been controlled so that very few mature trees are killed; in all old mixed stands there is natural pine reproduction and also abundant young hardwood growth,—absent under the old management; and the pure mature pine stands contain advance reproduction secured without soil preparation. Maintenance of crown density, without encroaching on the growing space necessary for the individual leaders, is the key to the situation.—*J. Roesser.*

2428. DUTT, SHAMBHOO. Annual report of the forest administration in Ajmer-Merwara for the nine months (1st July 1920 to 31st March 1921) 1920-21. 39 p. Ajmer, 1922.—The report details the work of the Forest Department. Fire protection was 99.5% successful. Natural reproduction is generally poor. Sowing of seeds inside thorn bushes was a success, as protection is afforded against grazing and excessive heat. Grazing administration is a source of great trouble. Financially the year was a success. Only minor experiments were carried out.—*S. B. Show.*

2429. EDIE, A. G. Report of the forest administration in the Bombay Presidency, (including Sind) for the year 1921-22. 114 p. Bombay, 1923.—The report details the work of the Forest Department. The need for economy delayed construction of development improvements. Fire protection was 95 per cent successful, as against 89 per cent for the preceding year. Protective spring burning was used extensively. Natural reproduction was generally unsatisfactory, while Taungya plantations show variable results. The post-war slump and failure of contractors affected timber cutting and the following of working plans. No important research work was accomplished, and technical problems requiring research are being inadequately handled, with little prospect of relief. The year showed a gross income of Rs. 72,97,200, of which 34.9 per cent was net. Political agitation forced extensive grants of additional privileges to the natives. Detailed tabulations of data and a summary of the entire report by the Secretary to the Government are included.—*S. B. Show.*

2430. ENGLISH, E. F. Prospects of a paper industry in South Africa. A review of the conditions with special reference to the question of raw materials. South African Jour. Indust. 6: 354-359. 1923.—The prospects of the industry are discussed with reference to the availability of sufficient raw materials,—grasses (tambookie and papyrus), and wattle products (wood and bark). The Albert and Howick falls are potential sources of hydroelectric power. Water is plentiful in Natal, although the cost of chemicals and transportation would be rather high.—*L. J. Goldblatt.*

2431. FORBES, A. C. Some results at Avondale Forestry Station. Jour. Dept. Agric. Ireland 23: 3-11. 4 fig. 1923.—Meteorological data are presented and the effects of spring frosts described. The economic value of over 60 species tested in pure and mixed stands is discussed. It is recommended that under conditions like those studied, Japanese larch and Sitka spruce be planted together, that larch and spruce be planted as nurse trees only with the faster growing species, and that large well-rooted plants be used, spaced 4-6 feet apart.—*Donald Folsom.*

2432. FRANCIS, W. D. Some characteristics of Queensland rain forests and rain-forest trees. Proc. Roy. Soc. Queensland 34: 209-219. 1922.—The relationship of rain forests to rainfall, soil, and climate in Queensland is discussed. Species of rain-forest trees with the following characteristics are enumerated and remarked upon: buttressed boles; fissured barks; scaly barks; very smooth thin barks; yellow inner barks; ochre-coloured inner barks; wrinkled surface of sapwood; blackwood (ebony); soft woods; woods depositing bright coloured ashes; coloured woods; large medullary rays; laticiferous barks; woody parts changing colour on exposure; characteristic odours; deciduous leaves; leaves turning red in age—*W. D. Francis.*

2433. FRANGOS, G. Exotic trees now existing in Cyprus. Cyprus Agric. Jour. 18: 85-89. 1923.—The list of trees submitted comprises 55 species in 37 genera.—*W. Stuart.*

2434. FRICK, PABLO. *Las nogaleras del Estado de Coahuila (Nogal comun)*. [The walnut groves of Coahuila.] México Forest. 1⁵⁻⁶: 11-13. 6 fig. 1923.—The walnuts along stream margins in northern Coahuila are of considerable local importance for their nuts, and their wood might be exploited for cabinet work. A large tree yields 400 kgm. of nuts in good years; average trees yield about 80 kgm. The trees suffer damage from a canker and also from a semi-parasitic plant known as "yedra," and an epiphyte, "parra." Planting stock should be grown in nurseries close to the planting site, and seedlings should be planted when 6-10 months old.—*W. N. Sparhawk*.

2435. G., M. *Note resumant la legislation portugaise sur l'application du regime forestier aux terrains et bois des particuliers*. [An outline of Portuguese legislation concerning the application of forestry to privately-owned lands and woodlots.] Bull. Soc. Centrale Forest. Belgique 30:16-21. 1923.—The Portuguese forest policy is outlined. The obligations and advantages accruing to corporate and individual forest owners are described.—*H. T. Gisborne*.

2436. GAMBLE, JAMES SYKES. *A manual of Indian timbers: an account of the growth, distribution, and uses of the trees and shrubs of India and Ceylon, with descriptions of their wood-structure*. xxvi + 868 p., 20 pl., 1 map. Sampson Low, Marston & Co., Ltd.: London, 1922.—This is a reprint of the 2nd edition (1902) with some corrections and notes on about 100 additional species. The general character of Indian forests by regions is described in the introduction, and suggestions are given for preparing local keys for identification of the various woods; a general key would be too complicated to be practical. Approximately 1,450 species of trees, shrubs, and woody climbers are described, of the nearly 5,000 found in India and Ceylon. For each are given technical and vernacular names; description of the tree, its bark and its wood; geographical distribution and habitat; silvicultural importance, and data on reproduction and rate of growth; physical properties of the wood; economic uses of the timber and other products. The terminology is based on J. D. Hooker's *Flora of British India*. The wood descriptions are based upon characters visible with a pocket lens, and 96 wood sections are illustrated. There are separate indexes for European, scientific, and vernacular names.—*W. N. Sparhawk*.

2437. GIBSON, A. J. *Progress report on forest administration in the Punjab for the year 1921-22*. 24 + lxxv p. Lahore, 1922.—The report details the work of the Forest Department, with a review by the Secretary to the Government. Fires covered 130,000 acres, or 16 per cent of the total area on which protection was attempted. Free use of timber, grazing, and fuel to the value of over 30 lakhs of rupees was granted. A new type of forest tillage, i.e., planting deodar along with field crops, was inaugurated with success. The continued drought and fires resulted in serious loss in the hill forests and in irrigated plantations. Much new construction work was done to aid in exploitation, and 3,588 acres were planted. The value of produce from departmental operations increased from Rs. 20,35,400 to Rs. 35,71,700, and in spite of difficulties and a slump in the timber market, a net surplus of 6.3 lakhs of rupees resulted. This province serves as a type of the difficulties of forest administration in India.—*S. B. Shaw*.

2438. GREVE. *Begründung von Kiefernbeständen*. [The establishment of pine stands.] Zeitschr. Forst.- u. Jagdw. 54: 449-468. 1922.—The origin of the large areas of heath land in northwest Germany is discussed. The poor results obtained in planting softwoods, especially pine, are due to soil conditions, and only copious precipitation prevents a steppe vegetation from replacing forest. Pine stands open up early, chiefly because of root rot, and as a result the soil can not be maintained in a healthy condition. Experiments should be made with species likely to be more suitable, such as Douglas fir. Pine, however, being frost-hardy and not exacting in its requirements, has become the important tree in this district. Further management in the pine stands should proceed upon the following principles: (1) selection or continuous forest is not applicable for pine or spruce; (2) on better soils hardwoods can be introduced into pine forest by the shelterwood system; (3) in young stands under-planting should be done to keep the soil in, or bring it into, a healthy condition; (4) "old field" spruce stands should be converted into mixed conifer-broadleaf stands; (5) for stands opening up in 50-60 years, and possible prey of "Kiefernsterben" (pine death), a root disease, Erdman's 2-aged high forest system is recommended; (6) for merchantable pine stands not adapted to

conversion into broadleaf mixture, cutting should progress gradually from north to south. By using the combined compartment-selection system, hardwoods may be introduced in strips, resulting eventually in orderly hardwood-softwood mixtures.—*J. Roeser*.

2439. HENKEL, J. S. *Forestry in Southern Rhodesia. Planting and care of forest trees.* Rhodesia Agric. Jour. 19: 687-693. 1922.—The article gives advice calculated to enable the farmer to grow trees with every prospect of success.—*L. J. Goldblatt*.

2440. HERRMANN. *Bericht über die Waldsamenernte für 1923.* [Data on the 1923 crop of forest-tree seeds.] Deutsch. Forstzeitg. 38: 761-762. 1923.—The prospect of obtaining supplies of tree seeds from Prussian forests is briefly described.—*W. N. Sparhawk*.

2441. HESS, EMIL. *Forstbotanische Monographie des Oberhasli von Interlaken bis zur Grimsel.* [Monograph on the forest botany of the Upper Hasli (Switzerland).] 92 p., 6 fig. Büchler & Co.: Bern, 1921.—In Part I the topography, geology, and climate of the valley are described in detail, with especial emphasis on the föhn winds. The favorable climate is attributed to the narrow valleys, protected against cold north winds, and the nearness of the lakes, rather than to the föhn.—In Part II, 146 native and introduced species of trees, shrubs, and woody vines are listed, following the nomenclature of Schinz and Keller (*Flora der Schweiz*, 1909). For each are given general distribution with relation to soil, exposure, and altitude, and detailed data regarding local occurrence.—Part III describes the various associations of woody plants. The valley is mostly covered with forest up to timber line. Formerly more was cultivated or pasture, but not being suited to agriculture reverted to forest or brush. By area, 70% is conifer forest (*Picea excelsa* 50%, *Abies alba* 10%, and *Pinus montana*, *P. cembra*, and *Larix decidua* 10%) and 30% broad-leaved (*Fagus silvatica* 25%, *Acer*, *Alnus*, *Betula*, and *Tilia* 5%). The forest and brush types, which are described in detail, are: (1) *Picea excelsa*; (2) *Larix decidua*; (3) *Pinus cembra*; (4) *Pinus montana*; (5) *Fagus silvatica*; (6) mixed broad-leaved—*Tilia parvifolia*, *Quercus robur*, *Acer pseudoplatanus*, *A. platanoides*; (7) pure *Acer pseudoplatanus*; (8) *Betula*—mostly hybrids of *B. pendula* (*B. verrucosa*) and *B. tomentosa* (*B. pubescens*); (9) *Alnus incana*; (10) *Alnus viridis* (brush); (11) *Rhododendron ferrugineum* and *R. hirsutum*; (12) low brush—*Vaccinium* spp., *Calluna vulgaris*, *Erica carnea*, *Juniperus communis* var. *montana*; (13) "lattice" brush—*Salix* spp., *Arctostaphylos* spp., *Dryas octopetala*, *Loiseleuria procumbens*, *Empetrum nigrum*. Based on a collection of 1,097 cones, data are presented on the distribution of the following forms and varieties of *Pinus montana*: var. *uncinata*, sub-var. *rostrata*, forms *macrocarpa*, *pendula*, *castanea*, and *versicolor*; sub-var. *rotundata*, forms *pyramidata*, *gibba*, and *mughoides*; sub-var. *pseudopumilio*; var. *pumilio*, forms *gibba*, *applanata*, and *echinata*; and var. *mugho*.—*W. N. Sparhawk*.

2442. KORDVAHR. *Geldwirtschaft und Gütererzeugung.* [Management for revenue and production of goods.] Zeitschr. Forst.- u. Jagdw. 54: 513-522. 1922.—The dispute between the adherents of the soil rental and the forest rental theories hinges on the problem whether the German forests should be managed for revenue and for the selfish interests of the owner, or whether the wood production should be governed by public necessities. German forest management must be governed by the principle of wood production to satisfy economic need. Economically, and from the point of view of the State, the entailed forest is in the best form of ownership, where personal interests can be satisfied only by improvement of the property. The most unfavorable form of ownership is private ownership of small tracts where a continuous form of management is very difficult of operation.—*J. Roeser*.

2443. KOTZE, J. J. *A note on the several species of Araucaria cultivated in South Africa.* Union South Africa Forest Dept. Bull. 6. 37 p., 14 pl., 1 map. 1923.—This is a compilation of published and unpublished information on 7 species of *Araucaria*. A key is given for distinguishing the species by their foliage and habits of growth, and their distribution and characteristics in their native habitats are described. Except in a few cases, the South African climate has proved too warm for *A. imbricata*, which thrives in England. *A. braziliensis* (*A. brasiliiana*) does very well, especially in the mountains of Natal. A tree planted in 1901 was 24 inches in diameter in 1921, and trees raised from its seed were 9.5-11.5 inches in diameter and already bearing large quantities of fertile seed. *A. Bidwilli* is commonly planted as an ornamental, grows rapidly, and endures a moderate degree of drought and frost. Only a few specimens of *A. Rulei* exist in the country, and it never will be important. *A. excelsa* is a

widely planted ornamental, but is injured by frost and drought. *A. Cookii* does well in sub-tropical localities in Zululand, where 25 acres planted in 1905 with a 20×20 feet spacing had produced in 1922 a volume of 68 cubic feet per acre per annum, with trees averaging 10.5 inches in diameter and 46 feet tall. The most valuable species is *A. Cunninghamii*, the wood of which is suitable for matches, boxes, and general purposes. A stand planted in Zululand in 1911, with a 10×20 feet spacing, has grown at the rate of 55 cubic feet per acre per annum and the trees average (1922) 5.5 inches in diameter. The author concludes that only 2 species should be considered for extensive afforestation in South Africa: *A. braziliensis* in the cooler mountain districts and *A. Cunninghamii* in the subtropical region near the east coast.—*W. N. Sparhawk*.

2444. KRUG. *Dauerwaldgedanken*. [Concerning the "Dauerwald."] Deutsch. Forstzeitg. 38: 839-842. 1923.—The experience of Saxony has demonstrated the fallacy of raising pure stands of spruce or other conifers. The yields, formerly large, have steadily diminished as the soil became impoverished. The first step in improving such stands is to retain and encourage the development of all broad-leaved species, including shrubs. Wherever practicable more beech should be introduced, also maple, oak, and ash, where the site is suitable. To secure natural reproduction it may be necessary to build up the soil by careful silvicultural measures and to develop seed-bearing trees by proper methods of thinning.—*W. N. Sparhawk*.

2445. L. *Reichsforstgesetz*. [Forest law for the Reich.] Deutsch. Forstzeitg. 38: 690-691. 1923.—The need for the proposed forest law is discussed in the light of Germany's requirements for timber. The yield of German forests in 1913 was 58,600,000 cubic m. (58.9 cubic feet per acre) and net imports were 14,900,000 cubic m., making the total consumption 1.11 cubic m. (39.2 cubic feet) per capita. The remaining forests can yield only 50,000,000 cubic m. under existing methods of management.—*W. N. Sparhawk*.

2446. LAMBERTS. *Zur Organisationsfrage der preussischen Staatsforstverwaltung*. [The organization of the Prussian state forest administration.] Zeitschr. Forst.- u. Jagdw. 54: 389-393. 1922.—The author criticizes Wahl's demands for separation of forest administration from current politics, and for the creation of forest directions (Forst direktionen) which were made in the report of the Empire Forest Society and the Associated Society of State Forest Administrative Officials. Lamberts does not believe that bureaucratic interference endangers the public interests in the forests.—*J. Roeser*.

2447. LIESE, J. *Die Wirkung des Pikrins bei Stockrodungen auf nachfolgenden Kulturen*. [The effect of picrate employed in the removal of stumps upon succeeding cultures.] Zeitschr. Forst.- u. Jagdw. 54: 543-548. 1922.—Half of the 2-year spruce planted on a blasted area in the Dietzhausen forest in the fall of 1920 died soon after planting. The characteristic yellow coloration of picrate in solution in the roots and wood showed that the loss was due to unburned picrate. Evidently a large quantity of picrate was retained in the soil after 1 year, in spite of the wet winter of 1920-21. Further experiments indicated that: blasting compounds containing picrate are poisonous to seeds and plants when in solution; decomposition products resulting from the explosion (CO_2 , H_2O , CO , H_2 and N_2) are harmless; poisoning of the soil can result only from careless scattering of the blasting material; scattering of picrate is especially dangerous on loamy soils and seed beds should not be established there after blasting; all powdermen should be warned against losing or scattering blasting munition.—*J. Roeser*.

2448. LOVEJOY, P. S. *In the name of development*. Amer. Forest. 29: 387-393, 447. 10 fig. 1923.—Forestry development in the U. S. A. is discussed in the light of personal experiences and observations.—*Chas. H. Otis*.

2449. LÜDERSEN. *Borgmann locutus—causa finita*. [Borgmann has spoken.] Zeitschr. Forst.- u. Jagdw. 54: 435-440. 1922.—Borgmann has persistently attacked the continuous forest idea in the columns of Forstliche Rundschau. The author points out that more tangible results can hardly exist than those obtained by continuous management practitioners, and that the pure, even-aged, high forest management practised in North Germany is unnatural and illogical. The argument that the continuous forest does not excel the clear-cut forest in volume production is not well founded. The reversion to the forest rental theory from the soil rental idea, which Borgmann considers an evil, is taken by the author as decidedly in favor of the new system.—*J. Roeser*.

2450. MAHOOD, S. A., AND D. E. CABLE. **The chemistry of wood. IV. The analysis of the wood of *Eucalyptus globulus* and *Pinus monticola*.** Jour. Indust. and Eng. Chem. 14: 933-934. 1922.—The results obtained from chemical analysis of these woods paralleled rather closely the results obtained by Schorger for broad-leaved and coniferous trees respectively.—*Henry Schmitz.*

2451. MAMGAIN, DAYANAND. **Annual report on the forest administration in Ajmer-Merwara for the year 1921-22.** 32 p. Delhi, 1922.—The report details the work of the Forest Department. Forest offences showed a slight increase, while fire protection was practically 100% successful. Natural reproduction continued poor, because of mortality during hot weather. Coppice with standards on a 30-40-year rotation is the only silvicultural system in use. The year showed a small cash surplus.—*S. B. Show.*

2452. MELROSE, G. P. **History written in trees.** Amer. Forest. 29: 414-415. 1 fig. 1923.—The record of successive fires is shown by scars on the yellow pine.—*Chas. H. Otis.*

2453. MERTEN. **Zur Betriebsregelung und Nutzungskontrolle in Preussen.** [Working plans and utilization control in Prussia.] Zeitschr. Forst.- u. Jagdw. 54: 469-478. 1922.—Since the E.B.R.A. (supplemental working plan instructions) of 1919 do not sufficiently consider the requirements of the mixed forest and of the uneven-aged silvicultural systems, which are constantly becoming more important and popular, and since there exists no necessity for stressing the importance of working sections, the author believes that they should be adopted only where it is desired to establish several rotations for the principal species. In general, the B.R.A. (working plan instructions) of 1912 should be retained, although the method of determining area representation of species can be improved; and in controlling the cut attention should be paid to increment and growing stock as well as to area and age. The emphasis placed upon working sections in the E.B.R.A. has led to an almost complete revolution of control book procedure which has made bookkeeping more difficult. The author discusses the new control book instructions.—*J. Roesser.*

2454. MILWARD, R. C. **Annual progress report on forest administration in the Presidency of Bengal for the year 1921-22.** iii + 49 p. Calcutta, 1922.—The report details the work of the Forest Department. The area of state forests remained at 10,696 square miles, or 13.5 per cent of the total area of the Province. Revised working plans for 46 square miles were completed and others are nearing completion; 146 miles of new road and trail were built, and Rs. 61,560 were spent on new dwellings. Fire protection was 95% successful, incendiaries being the chief source of trouble. About 45% of the forests were open to grazing. Taungya plantations show greater cost in the hills than in the plains. In the hills satisfactory natural reproduction of valuable species depends upon silvicultural operations. All regular plantations were surveyed and mapped during the year. The total outturn of timber was $7\frac{1}{2}$ million cubic feet. Departmental operations continued to show a good profit, although net surplus dropped from lakhs 8.48 to 6.10. Detailed tabulations covering all phases of the work, and a review of the entire report by the Secretary to the Government are included.—*S. B. Show.*

2455. OSMASTON, B. B. **Forest administration of the Central Provinces for the year 1920-21.** cxiii + 42 p. Nagpur, 1922.—The report covers the work of the Forest Department from July 1, 1920 to March 31, 1921. Shortage of staff and the necessity of extensive famine-relief work seriously hampered activities. About 300 miles of new roads were built. Fire protection was only 92.6% successful. Natural regeneration was seriously affected by the drought, and it was necessary, because of famine, to allow grazing in regeneration areas before the time contemplated by the working plans. The area of forest worked decreased by 4,000 acres. Departmental exploitation was satisfactory and is being extended. Adoption of the clear coppice method of working as standard is under consideration. There was a net surplus of Rs. 17,12,081 for 9 months, compared to Rs. 21,62,165 for the preceding year. The usual detailed tabulations are included, with a review of the entire report by the Revenue Secretary.—*S. B. Show.*

2456. PICHÉ, G. C. **Notes on the forests of Quebec.** 40 p., 1 fig. Dept. of Lands and Forests: Quebec, 1923.—Brief notes are given on the physiography, glaciation, hydrography, and climate of the Province. The forests producing merchantable timber cover 130,000,000 acres and are classified as: (1) northern forests dominated by *Picea* spp., *Pinus banksiana*, *Betula papyrifera*, and *Populus* spp.; (2) Laurentian forests with *Pinus strobus*, *P. resinosa* and

various hardwoods, the most valuable type in the province; (3) forests of the St. Lawrence plain, mostly in wood lots of hardwoods; and (4) Acadian forests in the southeast with *Picea rubens*, *Thuja occidentalis*, *Abies balsamea* and hardwoods as dominants. The activities of the provincial government in the management of cutting, reforestation, fire control, and forestry research are briefly noted.—*Geo. D. Fuller.*

2457. PINCHOT, GIFFORD. The blazed trail of forest depletion. *Amer. Forest.* 29: 323-328, 374. 8 fig., 1 chart. 1923.—This is largely the story of forest devastation in Pennsylvania.—*Chas. H. Otis.*

2458. POOL, RAYMOND J. Handbook of Nebraska trees: a guide to the native and most important introduced species. *Bot. Surv. Nebraska, N. S. No. 3.* [Also *Nebraska Conservation and Soil Surv. Bull.* 7.] 171 p., 74 pl., 50 distribution maps. 1919.—This is a popular account of the forest trees of the State, with keys for their identification and maps showing geographical distribution. [See also *Bot. Absts.* 6, Entry 522.]—*R. J. Pool.*

2459. QUEVEDO, MIGUEL A. DE. La influencia de los bosques en las lluvias. [The influence of forests on rainfall.] *México Forest.* 1^o: 1-10. 1923.—This is a reply to a statement by the engineer Aurelio Leyva that forests do not affect precipitation. After citing the conclusions reached by investigators in other countries, the author shows how destruction of forests in various regions of Mexico has been followed by marked diminution of local rainfall. This has been equally true in the dry northeast, in the humid southeast, and in the region of medium precipitation in the central part of the country.—*W. N. Sparhawk.*

2460. QUEVEDO, MIGUEL A. DE. La riqueza forestal de México. [Mexico's forest wealth.] *México Forest.* 1^o: 1-13. 3 pl. 1923.—The forest zones are described, beginning with the mangrove belts along the coasts and ascending through the tropical evergreen belt, the sub-tropical forest, the deciduous broadleaf forest, and the forests of pines and other conifers which reach 4,500 m. altitude. Forests of timber trees occupy about 10% of the land surface of Mexico, or about 20,000,000 hectares; chaparral and woodland, of value as a source of firewood and small timbers, occupies about 10,000,000 hectares. The total stand is estimated at 1½ billion cubic m., is the potential growth at 36,000,000 cubic m. a year. The country consumes approximately 20,000,000 cubic m. annually, but as enormous quantities of timber are destroyed by fire, the forest capital is being steadily reduced. Of the total consumption, about 3,000,000 cubic m. is handled in commercial transactions. Forest products constituted 16% in value of the total exports in 1910-1911. There is no need to reduce the forest area for agricultural use, as extensive areas of much better farm land are available. About 40,000,000 hectares of land is suitable for agriculture, over 50,000,000 hectares is too arid or poor in quality to support forest or brush cover, while more than 100,000,000 hectares should be permanent forest or range land. The natural restocking of lands abandoned during the last few years shows that vegetation will come back if given an opportunity.—*W. N. Sparhawk.*

2461. RAM, BAKHSI. Progress report of forest administration in Baluchistan for 1921-22. 25 p. Calcutta, 1923.—The report deals with the work of the Forest Department. An area of about 3,000 acres was fenced and experimental afforestation work started. Administration continued to cost more than receipts. Only small amounts of timber were extracted.—*S. B. Shaw.*

2462. RAVE. Abnutzungskontrolle und Abnutzungssatz. [Utilization control and yield.] *Zeitschr. Forst.- u. Jagdw.* 54: 425-428. 1922.—Working plans must be changed to secure better control of preliminary yields. The root of the trouble is the degree of thinning, due to lack of accurate knowledge of the changes in increment caused by thinnings. The intermediate yields must, therefore, be more accurately determined in the working plan. This requires constant use of the latest yield tables and application of the normal stand factor. Only thus will it be possible to separate final and preliminary yields.—*J. Roesser.*

2463. REYNOLDS, H. A. Town forests in Massachusetts. *Amer. Forest* 29: 421-424, 445. 7 fig. 1923.

2464. ROLDAN, ANGEL, y MAXIMINO MARTINEZ. El ahuehuete. [*Taxodium mucronatum* Ten.] *México Forest.* 1^o-1^o: 5-6. 2 pl., 1 fig. 1923.—This is a botanical description of the tree.—*W. N. Sparhawk.*

2465. ROTH, HUBERT. **Dauerwald und Betriebsart.** [The continuous forest and silvicultural system.] *Zeitschr. Forst.- u. Jagdw.* 54: 428-429. 1922.—When sand and soil culture are properly correlated, the continuous forest method may be used for every species and for every silvicultural system except the high forest with clear-cutting. The silvicultural system to be applied depends upon the forest condition, species, soil and climate, and economic and fiscal objects of management. Instead of choosing the theoretically ideal system, it is better to fix upon the one which can be most practicably conducted in the long run with the least loss resulting from the conversion process. Succeeding generations can more closely approach the ideal from the foundation thus laid.—*J. Roeser.*

2466. S. **Entwurf eines sächsischen Forstkulturgesetzes.** [Proposed forest law for Saxony.] *Deutsch. Forstzeitg.* 38: 832. 1923.—A bill recently introduced in the Saxon Diet aims to promote forestry on small private holdings, which constitute 28% of the forest area and for the most part are poorly handled. It proposes to set up local forest boards, composed of officials and forest owners, to supervise the administration of the law. Reforestation of denuded areas is made compulsory, and clear-cutting is forbidden except with written permission of the authorities. In general, clear-cutting is forbidden where reforestation is doubtful or in protection forests. Adoption of a working plan under the guidance of a trained forester may be required.—*W. N. Sparhawk.*

2467. SALAM, MD. ABDUS. **Report on Karai (*Sterculia urens*) tapping.** *Indian Forester* 49: 303-306. 1923.—By making 4 heavy oblong notches and by removing a wide band of bark, heavy yields of gum were obtained, much greater than from less heavy wounding. Trees on northern or eastern slopes gave the heaviest yields; the better the soil the heavier the yields; trees in the open gave less gum than those in shady places. Fresh gum loses about 15% of its weight in drying.—*E. N. Munns.*

2468. SALE, G. N. **Value of oak trees in Cyprus.** *Cyprus Agric. Jour.* 18: 97-98. 1923.—The oak of Cyprus (*Quercus infectoria*) while providing timber inferior to that of English and American oaks, is valuable and superior to pine, alder, or even plane. The author deplores the fact that there are very few good oak trees in Cyprus and recommends that more attention be given to their culture.—*W. Stuart.*

2469. SALLMAN, M. **Die beste Nutzweidesorten.** [The best basket willows.] *Gartenwelt* 23: 34-35. 1919.—Seventeen species, varieties, and hybrids of *Salix* which are suitable for basket making are described.—*J. C. Th. Uphof.*

2470. SCHONKEN, J. D. **Our indigenous trees and shrubs.** *South African Jour. Indust.* 5: 454-459. 1923.—The author discusses the problem of "siccation and afforestation." He favours retaining and improving indigenous trees since the exotics transpire far too freely, thus acting as strong exsiccators.—*L. J. Goldblatt.*

2471. SIM, T. R. **The black wattle industry. I, II, III.** *South African Jour. Indust.* 5: 467-472, 519-523. 1922; 6: 27-35. 1923.—An account is given of the history of the industry in Natal. The present situation does not warrant pessimistic views. The conditions most suitable for black wattle are an annual rainfall of 30-40 inches and the deep red or chocolate-coloured soil produced by disintegration of dolerite.—In connection with wattle culture the author discusses such factors as the preparation for sowing, spacing, rotation, and pruning.—The author discusses the quality and market value of wattle extract, in which form tannin is largely shipped. He also deals with cultural phases such as intercropping, recropping, pests, and yield.—*L. J. Goldblatt.*

2472. SMITH, HERBERT A. **The United States Forest Service.** 25 p., 1 fig., 9 pl. Government Printing Office: Washington, D. C. 1922.—This report, prepared to accompany the exhibit of the U. S. Forest Service at the Brazil Centennial Exposition, describes the organization and activities of the Forest Service. (Published also in Spanish and Portuguese.)—*W. N. Sparhawk.*

2473. STEVENS, E. R. **Annual progress report on forest administration in the province of Bihar and Orissa for the year 1921-22.** iii + 63 p. Patna, 1922.—The report covers in detail the work of the Forest Department. Shortage of officers, as elsewhere, seriously hampered the work. Fire protection was attempted on 875,000 acres and was successful on only 88.4 per cent. Good results from plantations of *Casuarina* have encouraged more extensive planting of this

species. The revision of working plans is still in arrears, although some progress was made. Private owners continue to exploit their forests recklessly, and show little disposition to undertake systematic management. Except locally, sal reproduction is generally good where annual burning favors it at the expense of evergreen species. Gross revenue increased from Rs. 8,10,602 to Rs. 9,00,373, while net surplus declined from Rs. 2,21,481 to Rs. 1,99,031, due to enlarged expenditures for communications and increased pay. The customary detailed tabulations are included, with a summary of the entire report by the Secretary to the Government.—S. B. Show.

2474. STONE, HERBERT, AND H. A. COX. A guide to the identification of the more useful timbers of Nigeria. 111 p., 4 pl. Crown Agents for the Colonies: London, 1922.—The following woods are described: *Scottelia kamerunensis*, *Garcinia* sp., *Lophira procera* (L. *alata*), *Eriodendron guineense*, *Triplochiton scleroxylon*, *Saccoglottis gabonensis*, *Klainedoxa gabonensis*, *Guarea* sp., *Khaya grandis*, *Loroa Klaineana*, *Pterocarpus tinctorius*, *Paradaniellia Olivierii*, *Azelia africana*, *Brachystegia spicaeformis*, *Erythrophleum guineense*, *Cylicodiscus gabunense*, *Piptadenia africana*, *Albizzia* sp., *Terminalia* sp., *T. superba*, *Casearia* sp., *Sarcocephalus esculentus*, *S. sambucinus* (?), *Adina microcephala*, *Mitragyne macrophylla*, *Alstonia congensis*, *Uapaca Staudtii*, *Ricinodendron africanus*, *Excaecaria* sp., *Chlorophora excelsa*, "akoto," "apara," "oregbo erin," "papapa." For each are given locality where found, vernacular names, general characteristics of the wood, and detailed descriptions of the structure in transverse, radial, and tangential sections. For most of them the bark sapwood, and uses are also described. A simple key for popular use and a bibliography are appended.—W. N. Sparhawk.

2475. SWART. Zur Frage der Rohhumusdüngung. [Concerning raw humus fertilization.] Zeitschr. Forst.- u. Jagdw. 54: 393-401. 1922.—The success of reforestation depends upon fertilizer and water. With favorable moisture conditions, raw humus is most available to the plants when mixed with mineral soil. In dry regions the upper soil layer must not be mixed with raw humus, or at most only to a limited degree. In general, it is sufficient to cover the finer raw humus with a layer of earth; in this state it is more beneficial over extensive areas than raw humus in actual mixture with mineral soil. The plow-furrow method of cultivation is the most unfavorable and unsafe, for it fails to make the raw humus available as fertilizer and does not take moisture into consideration. The author sees no reason for criticizing the trench strip method, provided it is properly applied and satisfies the demands of the operation.—J. Roeser.

2476. TANAKA, T. An ornamental parasite. Jour. Hereditv 14: 163-164. 1 fig. 1923.—To produce ornamental spots the Japanese inoculate culms of bamboo (*Arundinaria narihira*) with certain species of fungi (*Miyoshia fusispora* Kawan.; *Melanconium shiraianum* Syd.; *Didymobryum kusanoi* P. Henn.; or *Eutypa kusanoi* Henn.) The value of the culms for making basketry is greatly enhanced by the process.—R. C. Cook.

2477. TIREMAN, H., ET AL. Administration report of the forest department of the Madras Presidency for the year (ending 31st March 1922) 1921-1922. 88 + *lrv* + 10 p. Madras, 1922.—The report details the work of the Forest Department separately for each of the 6 working circles, with summaries by the Chief Conservator and the Secretary to the Government. The area of State forests increased by 37 square miles to a total of 18,863 square miles. Little progress was made in preparation of working plans. To open up valuable forests, 279 miles of road were constructed. While the organized non-cooperation political campaign made protection difficult, early protective burning was done on 1,455 square miles, and fire protection was successful on 93 per cent of the 5,844 square miles on which it was attempted. The output of timber was 108,400 tons, of which 20,825 were extracted by departmental agency; in addition 323,625 tons of fuel were extracted. Bamboo and sandalwood were important sources of income. About 21 per cent of the forests were closed to grazing. Regeneration of teak is accomplished by clear cutting with sowing or planting; of the evergreen forests by preliminary girdling to accustom advance reproduction to light, followed by clear cutting; of sal, by clear cutting. The Department showed a slight deficit during the year, due to large capital expenditures on development.—S. B. Show.

2478. TRTUS, H. Michigan, Onward! Amer. Forest. 29: 400. 1923.—Progressive fire and forestry legislation enacted in Michigan in 1923 is cited.—Chas. H. Otis.

2479. TRAFFORD, F. **Progress report of the forest administration in the province of Assam for the year 1921-22.** 63 p. Shillong, 1922.—The report deals in detail with the work of the Forest Department. The area of reserved forests was reduced by 62 square miles to allow for agricultural use. Some improvement in communications was made, and a working plan was made for the Shillong pine forest. While much additional work is needed, the financial situation offers slight prospects for increasing the present inadequate staff. The problem of maintaining the valuable sal in the forests remains unsolved. The net surplus dropped from Rs. 5,64,942 to Rs. 3,05,517. Detailed tabulations of the work, and a review of the entire report by the Secretary to the Government are included.—*S. B. Show.*

2480. TROUP, R. S. **Report on forestry in Uganda.** 39 p., 1 map. Crown Agents for the Colonies: London, 1922.—The commercial timber type is the evergreen rain-forest, composed of a great variety of trees, located mostly near the lakes or on the Elgon and Ruwenzori Mountains. This type covers approximately 2,343 square miles, or 2.5 per cent of the land area; 300 square miles are owned by the natives, the rest being Crown forest. Open savannah forest, mostly evergreen, covers most of the level or rolling land in the Protectorate. It varies in economic importance from the worthless scrub in dry localities to the "mvule" (*Chlorophora excelsa*) forests which occupy about 700 square miles north of Lake Victoria and are of considerable value. The savannah forests suffer greatly from periodic fires. Evergreen bush, mostly of thorny species, is of local occurrence and of little economic importance.—While the local demand for wood for building and for fuel is greater than the present output, eventually there may be a surplus for exportation to Kenya, Sudan, and Egypt. The chief minor products are rattan (*Calamus* sp.) and raphia fiber (*Raphia Monbuttorum*). Rubber plants (*Funtumia elastica*, *Landolphia Daweei*, and *Clitandra orientalis*) occur, and the abundant elephant grass (*Pennisetum purpureum*) is a possible source of paper pulp, but none of these is now of commercial importance.—A forest department was organized in 1918, but because of inadequate appropriations and personnel has been able only to make a beginning in developing a forest policy for the country. Recommendations are made for further reservation of forest land, establishing plantations of fuel and timber trees, organizing fire protection, research in silviculture and utilization, expansion of the forest department, and systematic exploitation of the forests chiefly by the Government. Instead of the selection method of cutting, which takes the best trees and results in steady deterioration of the forest, it is recommended that clear-cutting with artificial regeneration be the rule for main fellings, together with subsidiary fellings taking out the mature and overmature trees from other parts of the stand.—An appendix contains descriptions of various forest districts and discusses their present utilization and proposed management.—*W. N. Sparhawk.*

2481. TUNIS, THEOPHILUS. **Forestry for profit. How the woodlot can be made to pay.** xiii + 296 p., 17 pl. G. P. Putnam's Sons: New York and London, 1923.—An intensive system of forestry for farmers is proposed. The essential features are: clear-cutting of the existing woods, drainage and cultivation of the land, planting (6 × 10 feet spacing) of Carolina poplar, white pine, and loblolly pine, regular cultivation and annual pruning of the growing stand. The poplar, becoming marketable at the 10th year, should be cut in installments up to the 25th year, and all but a few selected pines by the 40th year. Meanwhile yellow poplar (tulip), oak, ash, walnut, and other species should be underplanted, to furnish a final crop of hardwood timber.—*W. N. Sparhawk.*

2482. WALLACE, T. **A state that abandoned its forests.** Amer. Forest. 29: 277-282. 5 fig. 1923.—This is a popular article on the deplorable forest conditions of Kentucky.—*Chas. H. Otis.*

2483. WHITE, C. T., AND W. D. FRANCIS. **Queensland trees, No. 18.** Queensland Agric. Jour. 19: 197-199. Pl. 43-44. 1923.—Some of the chief field characteristics of *Halfordia drupifera* are described. The economics of the timber and the distribution of the tree are outlined.—*W. D. Francis.*

2484. WHITE, C. T., AND W. D. FRANCIS. **Queensland trees, No. 19.** Queensland Agric. Jour. 19: 304. Pl. 65. 1923.—Some of the field characteristics and the distribution of *Stenocarpus salignus* are outlined.—*W. D. Francis.*

2485. WHITE, C. T., AND W. D. FRANCIS. Queensland trees, No. 20. Queensland Agric. Jour. 19: 409. Pl. 93-94. 1923.—The distribution and some of the field characters of *Ackama paniculata* are outlined.—W. D. Francis.

2486. WHITE, C. T., AND W. D. FRANCIS. Queensland trees, No. 21. Queensland Agric. Jour. 19: 513. Pl. 111-112. 1923.—The field characters of *Sloanea (Echinocarpus) australis* are described and its distribution outlined.—W. D. Francis.

2487. WHITE, C. T., AND W. D. FRANCIS. Queensland trees, No. 22. Queensland Agric. Jour. 20: 46. Pl. 2-3. 1923.—Some of the field characters of *Litsea reticulata* are described and its distribution and the economics of its timber are outlined.—W. D. Francis.

2488. WHITE, C. T., AND W. D. FRANCIS. Queensland trees, No. 23. Queensland Agric. Jour. 20: 90. Pl. 13-14. 1923.—The chief field characters, distribution and economics of the timber of *Nephelium Lauterianum* are outlined.—W. D. Francis.

2489. WHITE, C. T., AND W. D. FRANCIS. Queensland trees, No. 24. Queensland Agric. Jour. 20: 175. Pl. 39-40. 1923.—The chief field characters, distribution and uses of the timber and fruit stones of *Elaeocarpus grandis* are outlined.—W. D. Francis.

2490. WILBRAND. Altersbestimmung der Riesenbäume. [Age determination of giant trees.] Zeitschr. Forst.-u. Jagdw. 54: 385-389. 1922.—By comparing diameter measurements made in 1921 and some 20 years previously, the ages of some well known Hessian trees were determined. The Ludwigs' beech was found to be 268 years old, the Schimsheimer elm (possibly the largest elm upon the continent) 396 years, and the Gambs oak 550 years, as against estimated ages of 300, 600, and 400 years, respectively. Further comparisons of the same kind are desirable, not only to determine the ages of veteran trees but also to determine the ages at which various species cease to grow, and to compare the diameter growth in old age of various species.—J. Roeser.

2491. WILDEMAN, ÉMILE DE. (Editor.) Mission forestière et agricole du Comte Jacques de Briey, ingénieur agronome, au Mayumbe (Congo Belge). [Forestry and agricultural expedition to Mayombe, Belgian Congo.] xiv + 468 p., 15 p., 63 fig. D. Reynaert: Brussels, 1920.—Data collected by de Briey during 1911-1913 are presented. Chapter I (pp. 1-266) describes the forest and other vegetation and many individual species. Brush covers 55 per cent of the region, secondary forest 37 per cent, and virgin forest 8 per cent, while in the forest region proper brush occupies 10 per cent, second growth 65 per cent, and virgin forest 25 per cent. Frequent fires and shifting native cultivation have destroyed the virgin forest which originally covered most of the region, and most of that remaining is more valuable for its influence on water supply than for its timber. The transition from virgin forest to open savannah usually takes 150-200 years. The native villages should be fixed on permanent sites, and further clearing of virgin forest prevented. This type of forest is now chiefly confined to the poorer soils. There are listed and briefly described 268 woods, and the species which may yield timber are systematically described, including the following new species: *Celtis Brieyi* De Wild., *Croton Brieyi* De Wild., *C. pseudoniloticus* De Wild., *Cordia Goossensi* De Wild., and *C. Goossensi* var. *longifolia* De Wild. Trees and other plants capable of yielding paper pulp are discussed briefly. A systematic list of all the identified plants collected by de Briey and Derumier, with a few collected in the same region by Goossens, includes the new species *Cissus Brieyi* De Wild.—Chapter II (pp. 267-288) describes in detail the various species of *Dioscorea*, a very important food plant.—Chapter III (pp. 289-370) describes the bananas (*Musa* spp.), which are of extreme importance in Mayombe furnishing the staple food as well as being the source of banana flour, fibers, and alcohol. The following new species, varieties, and forms are described and illustrated: *Musa emasculata* De Briey, and vars. *Lomba*, *Kiala*, *Kimhende*, *Zengani*; *M. protractorachis* De Briey; *M. decrescens* De Briey, and vars. *Pembuki* De Briey; *viridis* De Wild., and *rubromaculata* De Wild.; *M. purpurea-tomentosa* De Wild.; *M. bidigitalis* (De Briey) De Wild.; *M. paradisiaca* vars. *Bende*, *Kitebbe*, *Bilu*, and *viridis* De Briey, and the following forms of the last variety: *Seluka*, *Funu-Nua*, *Kilola*, *Dongila*, and *Tubu*; *M. Brieyi* De Wild.; *M. sapientium* var. *Satama* De Briey, and form *rubra* De Wild.; *M. sapientium* var. *Fieloto* De Briey.—Chapter IV. (pp. 371-440) deals with oil palms (*Elaeis* spp.). The East Indian plantations are likely to obtain control of the palm oil industry as they have of rubber, unless steps are taken to develop the natural oil palm resources of Africa in a systematic way. The distribution of *Elaeis* in Mayombe is discussed, with botanical descriptions, internal structure, growth, longevity, varieties, and productivity in comparison with other regions.—W. N. Sparhawk.

GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 2137, 2138, 2157, 2164, 2166, 2180, 2287, 2351, 2392, 2608, 2685, 2693, 2714, 2756, 2851, 2910, 3187, 3204)

2492. ANONYMOUS. [Pomological studies at the New York Experiment Station.] New York Agric. Exp. Sta. [Geneva] Rept. 1922. p. 44-45. 1923.—Pomological studies are briefly reported, including pruning of tree fruits and grapes, methods of propagating apples, a test of plum varieties on different stocks, selection for length of stem in violets, effect of grass on apple trees, germination of seeds on hardy fruits, study of sex of grapes with reference to fruit development, and variety testing of vegetables. In a bud selection experiment in which Rome Beauty apple trees were propagated from high and low yielding parents no differences were observed in the performance of the progeny of either parent over 10 years. Baldwin apple trees secured from 40 locations in the U. S. A. produced fruit similar in size, color, season, and quality. Ten new varieties of fruits are mentioned as having been named and introduced.—*George L. Slate.*

2493. ANONYMOUS. Sterility in hybrids. Jour. Dept. Agric. Victoria 20: 279. 1922.—The farmer's Union Advocate of New Zealand reports the occurrence of a foal of distinct species obtained as a result of a cross between a pony stallion and a female ass, the latter being the result of a cross between a wild stallion ass from Africa with a Tibetan mare ass. The coloring and shape of the foal suggest that it may be capable of breeding.—*Charlotte Elliott.*

2494. BATESON, W. The inheritance of acquired characters in *Alytes*. Nature 112: 391. 1923.

2495. BLARINGHEM, L. Études sur la sélection du lin. 1. Caractères morphologiques utilisés pour la séparation et le contrôle des lignées pures. [Studies in the selection of flax. 1. Morphological characters utilized for the separation and the control of pure lines.] Rev. Bot. Appl. et Agric. Coloniale 3: 3-25. 3 fig. 1923.—Experiments for the selection of true-breeding fiber flaxes of high quality have been conducted since 1918 with *Linum usitatissimum* and *L. angustifolium*. The use of morphological characters, such as color of flowers and seed, height of stem, form and shape of capsules, and branching and notching of seed within the capsules, has played a considerable part in the recognition of varietal impurities in commercial varieties. Most plants proved self-fertilized, so indicated immediately after flowering by the undisturbed pollen on the stigmas. It was found that fiber flaxes of good quality were accompanied by a higher percentage of aborted pollen grains than non-fiber flaxes. Also, the tallest and most vigorous plants showed less perfect sexual organs. Lines with short distal internodes of 4 cm. or less were characterized as possessing good fiber characters. Apple-shaped capsules seemed to be characteristic of late and long fiber flax. Ciliated and non-ciliated septa were observed in varying ratios in all varieties under test. Only 1 flax, Maroc, bred pure for this character. From several selections of Russian flax, 1 line named EGBK proved to be constant for 5 generations at least, under dry and humid conditions.—*L. R. Waldron.*

2496. BLARINGHEM, L. Notes sur la biologie des rouilles et des charbons; II. La rouille le noire (*Puccinia graminis* Pers.) au printemps de 1923 à Bellevue (S. et O.) sur les blés résistants et leurs hybrides. [Notes on the biology of rusts and smuts; II. The black rust (*P. graminis* Pers.) in the spring of 1923 at Bellevue, on rust resistant wheats and their hybrids.] Rev. Path. Veg. et Entomol. Agric. 10: 225-234. 1923.—Wheat belonging to the same species but grown from seed obtained from different regions may differ as to rust resistance; wheats obtained from rust-free African wheats rusted heavily when grown under the Parisian climate, while wheats belonging to the same species, *Triticum sphaerococcum*, probably originated from the same African regions but having been grown for several years in France, resisted somewhat better. While *T. monococcum* is generally rust resistant, the variety *T. monococcum Zagrabensis*, obtained from southern countries, was rusted the 1st year it was grown near Paris. When crossed with non-resistant wheat, the rust resistant *T. monococcum* yields non-resistant hybrids. As a general rule it is stated that the more vigorous the hybrid the more it

rusts. Hybrids resulting from crosses with *T. polonicum*, being less vigorous than this parent, rust less heavily.—*J. Dufrenoy*.

2497. BLARINGHEM, L. Sur l'hérédité en mosaïque de la duplication des fleurs de *Cardamine pratensis* var. [Mosaic heredity of floral duplication in *Cardamine pratensis* var.] *Compt. Rend. Acad. Sci. Paris* 176: 1734-1737. 1923.—A study is reported of inheritance of a type of proliferation occurring spontaneously in populations of *Cardamine pratensis*. The proliferated form produces some good pollen but no functional ovules. Normal ♀ × proliferated ♂ gave normal F₁, but late in the season about $\frac{1}{10}$ of the plants exhibited various degrees of a mosaic condition as a consequence of production of more or less proliferated flowers on certain portions of the inflorescence. Normal F₁ × mosaic F₁ yielded 98 plants, 10 of which were mosaics, none completely proliferated. Mosaic F₁ selfed yielded 47 plants, 5 of which were mosaics, and only 3 bore exclusively proliferated flowers. Other combinations gave similar results, so that the author concludes that the 2nd generation behaved essentially like the 1st. The author compares this case with that of pelory in *Digitalis* and argues that marked aberrations of this kind do not conform to Mendelian laws.—*R. E. Clausen*.

2498. BLUMER, SAMUEL. Variationsstatistik als Hilfswissenschaft der Biochemie der Pflanzen. III. Variation des Amygdalingehaltes in den Samen einiger Prunusarten. [Variation statistics as scientific aids in the biochemistry of plants. III. Variation of the amygdalin content in the seeds of several *Prunus* species.] *Biochem. Zeitschr.* 137: 125-132. 1923.—The variation in the amygdalin content of apricot, peach, and plum kernels is presented statistically. Wider variation occurred in the kernels used for drugs than in those secured from 1 tree. The great differences in amygdalin content were considered an indication that physiological races exist within morphological species. Usually, negative correlation was found between seed weight and percentage of amygdalin content. [See also *Bot. Absts.* 13, Entry 417.]—*Richard Wellington*.

2499. BREEZE, M. S. G. Degeneration in potato flowers and causes of sterility. *Gard. Chron.* 73: 176, 188. 1923.—The author has examined pollen of many of the Solanaceae and finds (1) triangular long grains with 3 germ pores, (2) pentagonal long grains (twice as long as broad) with 5 germ pores, and (3) pentagonal short grains (approximately isodiametric) also with 5 germ pores. Among potato varieties "susceptible to wart disease, long pollen is coupled with a much higher degree of susceptibility to the disease than is short pollen." Viable compound pollen grains, due to irregularities in tetrad formation, are found in certain varieties which have short pentagonal grains.—Degeneration of pollen in plants which have shrunken grains begins after tetrad formation and is due in some cases to irregular heterotypic divisions. Complete or partial sterility in certain potato varieties appears to be due to an invasion of the young anther by Amoebae, followed by infection by a Chytridiaceous fungus. In some cases the action of these organisms apparently causes hypertrophy of the pollen.—*E. Dorsey*.

2500. BREITENBECHER, J. K. Somatic mutations and elytral mosaics of *Bruchus*. *Biol. Bull.* 43: 10-22. 1922.—Thirty-one elytral mosaic females were found among thousands of *Bruchid* insects examined. The assumption of a dominant somatic mutation in 1 chromosome of the pair offers the most plausible explanation. The time of the ontogeny at which the mutation occurred would govern the extent of its effects; the earlier, the greater. The factor mutations discovered by the author (1921) are transmitted, but the elytral mosaics are not. There appears, however, to be a somatic continuity between the gene *R* (red) in the germ cell and the same gene as manifested through the somatic mutations. Both somatic and germinal mutations originate in the chromosome, but whether the mutation is germinal or somatic is determined by the time at which it occurs.—*Robert K. Nabours*.

2501. BROTHERTON, W. Further studies on the inheritance of "rogue" types in garden peas (*Pisum sativum*). *Jour. Agric. Res.* 24: 815-852. 8 pl. 1923.—Primary rogues occurring in the *Gradus* variety are considered to be due to the mutation of a single factor *x* to *X* and have the heterozygous formula *xX*. They give in the following generation only homozygous secondary rogues, *XX*, through recurrent (mass), somatic mutation of the *x* factor to *X* which is believed to occur because of the instability of the combination *xX*. Crosses of *Gradus* by *Gradus* rogue and reciprocal likewise produce an unstable F₁ in which mass somatic muta-

tion of x to X occurs, giving plants homozygous for the X factor in by far the greater number of the somatic cells. Only an occasional x gamete is produced and the F_2 consists almost entirely of rogues (XX), the Gradus type (xx) very rarely appearing. A variety of peas, English Mummy, which rarely produce rogues has a stipule intermediate between Gradus and Gradus rogue determined by a factor Y , allelomorphous to y of Gradus and linked with the A factor for colored flowers with 20% of cross-overs. This variety has a factor, x^1 , allelomorphous to the x factor in Gradus type and to the X factor of Gradus rogue which is practically identical with the x factor in its expression but only rarely mutates to X even in the combination x^1X . The cross of Gradus rogue by Mummy is fairly stable although the factor x^1 mutates to X sufficiently to disturb the expected ratio of 3 rogues to 1 non-rogue in F_2 by an excess of X gametes and consequently of XX and Xx^1 zygotes. The factor Y tends to prevent the change of x^1 to X .—*D. F. Jones.*

2502. C., W. E. *Natural history of pheasants.* [Rev. of: BEEBE, WM. *A monograph of the pheasants.* Vol. 4. $xv + 242$ p., 23 col. pl., 27 photogravure pl., 6 map. H. F. and G. Witherby: London, 1922.] *Nature* 112: 574-576. 1923.

2503. CUÉNOT, L., R. LIENHART, ET M. MUTEL. *Expériences montrant la non-hérédité d'un caractère acquis.* [Experiments showing the non-inheritance of an acquired character.] *Compt. Rend. Acad. Sci. Paris* 176: 611-613. 1923.—A definition of inheritance of acquired characters and a general account of previous vain efforts to establish the validity of the hypothesis are given. Experiments of Bouchard and Charrin (1886) in producing cataract in adult rabbits following ingestion of naphthaline, and of H. Pagenstecher (1911) in producing ocular malformations in the young by having pregnant rabbits ingest naphthaline are recorded. The experiments of Guyer and Smith (ingestion into pregnant rabbits of fowl serum prepared through use of rabbit lenses) are considered parallel with those of Pagenstecher. The abnormal eyes induced by both methods are reported to be inherited (the Pagenstecher method by Duerst) by successive offspring without further anti-ocular treatment. The authors have repeated the Pagenstecher-Duerst experiment twice. In 1 case the pregnant rabbit became suddenly blind and bore 9 young, all blind. Two of these produced only normal-eyed young in F_2 . The other female did not go blind but after the 3rd treatment gave 7 still-born young all with defective lenses. This female was next bred to a blind male, from a mother treated with naphthaline, and all 6 of the young were normal. The authors do not pretend to have upset Guyer and Smith's, or even Duerst's, results, but emphasize the importance of independent repetition.—*Robert K. Nabours.*

2504. CUNNINGHAM, J. T. *Dr. Kammerer's lecture to the Linnean Society.* *Nature* 112: 133. 1923.—A reply to MacBride's criticism of the author's statement concerning Kammerer's lecture to the Linnean Society. The question at issue is the peritoneal investment of the ovary in Salamandra and birds. Kammerer stated that the ovary of the former is enclosed in a membrane while that of the latter is not. The author made a new dissection of a hen, and found the ovary "almost as completely invested by peritoneum as that of Salamandra." The author continues with regard to Kammerer's lecture that it "in my opinion failed to show that Dr. Kammerer had an adequate conception of the range of knowledge, the completeness of evidence, and the validity of reasoning, required to establish the conclusion he asks us to accept."—*H. H. Plouah.*

2505. CUNNINGHAM, J. T. *Human embryology and evolution.* *Nature* 112: 539. 1923.—The author replies to Arthur Keith (*Nature* 112: 257-268. 1923.)

2506. DANIEL, LUCIEN. *Régénérescence de la pomme de terre par la greffe.* [The regeneration of potatoes by grafting.] *Compt. Rend. Acad. Sci. Paris* 176: 857-858. 1923.—Tomato and belladonna [*Atropa*] were grafted upon potato stocks. The potato tubers showed an improvement in turgescence, resistance, and precocity. Potato scions were also grafted upon tomato and egg plant stocks. Aerial tubers were formed which were more resistant than the normal tubers.—*C. H. Farr.*

2507. DANSER, B. H. *Fünf neue Rumex-Bastarde.* [Five new Rumex hybrids.] *Rec. Trav. Bot. Néerland.* 19: 293-308. 5 pl. 1923.—The author gives Latin descriptions of 5 *Rumex* hybrids of unusual combinations. *Rumex Kloosu* (*dentatus* \times *maritimus*), *R. Didericæ* (*maritimus* \times *obovatus*), *R. Thellungii* (*dentatus* \times *obovatus*) are the results of cross pollina-

tions in his own garden. *R. hagensis* (*patientia* × *pulcher*) was 1st observed by him in Haag and later grown in his garden at Amsterdam. *R. upsaliensis* (*dumosus* × ?), a bronze colored plant, was grown by him from seed from Upsala.—*Charlotte Elliott*.

2508. DAVENPORT, EUGENE. Continuous selection of corn for special characteristics. 35th Ann. Rept. Illinois Agric. Exp. Sta. 1921-1922. 15-16. 1923.—A brief summary is given of the results of selection for high and low protein and oil, for yield, for high and low ear, and for 2-eared stalks. In all of these characters selection seems to be effective. The high protein and high oil strains were higher, and the low oil strain lower, than in any previous crop, this being the 25th generation of selection.—*J. H. Kempton*.

2509. DAVIDSON, W. D. Effect of selection of "seed" on the yield of the potato crop. Jour. Dept. Agric. and Tech. Instr. Ireland 22: 378-380. 1923.—A report is presented of results obtained with 7 varieties of potatoes, in 1922, by planting selected and non-selected seed, the former consisting of tubers from plants producing above the average and the latter from tubers of corresponding size from other plants but without regard to the productivity of the parents. The plots from selected seed showed 35% leaf roll, those from unselected seed 58%. In general, the yield of the former was superior to that of the latter.—*C. H. Myers*.

2510. DUNLAVY, HENRY. Correlation of characters in Texas cotton. Jour. Amer. Soc. Agron. 15: 444-448. 1923.—In a population of 167 individuals the coefficients of correlation for 21 pairs of characters were determined. Significant correlations were found in 8 cases, the correlations having been positive between lint index (abundance of fiber) and seed weight, boll weight and seed weight, percentage of 5-lock bolls and boll weight, boll weight and lint index, and seed weight and fiber length. There were negative correlations between seed weight and lint percentage, lint percentage and fiber length, boll weight and lint percentage.—*T. H. Kearney*.

2511. EAST, E. M. Genetical aspects of self and cross-sterility. Amer. Jour. Bot. 10: 468-473. 1923.—Experiments on self- and cross-sterility in the genus *Nicotiana* during the last 12 years, carried on for the last 3 years by A. E. ANDERSON, are reported. Five self-sterile species, *N. alata*, *N. angustifolia*, *N. commutata*, *N. glutinosa*, and *N. forgetiana*, and 1 self-fertile species, *N. Langsdorffii* were used. In crosses of *N. forgetiana* and *N. alata* with *N. Langsdorffii*, seed were formed as readily as in the parent species. The F_1 was self-fertile; the F_2 gave a 3:1 ratio of self-fertile and self-sterile, confirming Compton's work on *Reseda*.—In the self-sterile species, on old plants at a high temperature, a few buds can be selfed. The self-sterile strains are each made up of a certain number of classes, each plant being cross-sterile with the other plants in its own class, but cross-fertile with the plants of all other classes. Using the late selfed seed, populations have been bred by continued selfing containing only 1 or 2 self-sterile classes. Reciprocal crosses behave in the same way. About 15 classes have been proved to be genetically distinct, by showing each to be fertile with every other class. Probably there are more than 20 intra-sterile and cross-fertile classes of self-sterile plants in the progeny of *N. forgetiana* and *N. alata*. "The factors which govern the behavior of self-sterile plants are strictly inherited, and are transmitted in accordance with a definite Mendelian mechanism."—*John Belling*.

2512. EBSTEIN, ERICH. Klinische Beobachtungen über Vererbung von Krankheiten. [Clinical observations on the inheritance of disease.] Arch. Rass.- u. Ges. Biol. 15: 34-47. 1923.—A summary is submitted of the author's observations during the past 10 years, with historical notes relative to the conditions discussed. The following conditions are reviewed and all classed as hereditary to a greater or less extent: albinism, polycythaemia, funnel breast (dominant in some families, recessive in others), hyperdactyly, zygodactyly, brachydactyly, ankylosis of bones of little finger, hyperextension of fingers, crooked fingers, deformed nails, hyperkeratosis, supracondyloid process, hare lip, malformation of lower lip, situs inversus, appendicitis, tendency to hernia, some heart diseases (including forms of mitral stenosis), arteriosclerosis, renal disease, renal calculi, gastric ulcer (60%), gastric cancer (10%), gall stones (40%), migraine, diabetes insipidus, and alkaptonuria. In addition adiposity, gout, and diabetes mellitus are apparently interchangeable manifestations of an hereditary diathesis. Finally, it has been noticed that in many families 1 or 2 affected individuals alternate with 1 or 2 who are normal, and the author raises the question as to whether this phenomenon

is indicative of some "constitutional rhythm" with a cycle of about $2\frac{1}{2}$ years, which may influence the production of abnormalities.—*C. H. Danforth.*

2513. ELDERTON, ETHEL M. A summary of the present position with regard to the inheritance of intelligence. *Biometrika* 14: 378-408. 13 *diagr.* 1923.—The writer first discusses, and by diagrams and tables measures, the strength of inheritance of intelligence when that intelligence has been judged by some one knowing the children and adults.—Examinations and estimates of teachers in English primary and secondary schools and at Oxford show that boys with slow, dull intelligence have brothers with the same grade of intelligence. This applies also to sisters, and a number of sons at Oxford who obtained 1st and 2nd class honors fell steadily according to the degrees taken by the father.—The results of the above tests are compared with those obtained when intelligence was judged by the Stanford Revision of the Binet-Simons tests. By this method 216 pairs of siblings in orphanages were tested and the intelligence quotient calculated. A higher correlation coefficient was obtained than would be expected from previous examinations but when correction for age was made the results agreed with former tests. These siblings resembled one another about as closely as children whose home conditions vary much more. The writer feels that inheritance of intelligence is a fact very little, if at all, affected by environment and that whether the intelligence of children is measured by the intelligence quotient or by estimate of teachers, the correlation between the intelligence of siblings is of the same order.—The feeble-minded tend to remain so, the average remain average, and the superior, superior. While education may not increase intelligence it may give an existing intelligence help in achieving success.—*Charlotte Elliott.*

2514. EMERSON, R. A. The inheritance of blotch leaf in maize. *Cornell Univ. Agric. Exp. Sta. Mem.* 70. 16 p., 3 *fig.* 1923.—Yellowish colored areas in the leaves of maize, the tissues of which usually die, are inherited as a recessive character dependent upon a single main pair of factors, *Bl bl*. The intensity of expression varies with the amount of sunlight being less noticeable when the plants are grown in shade. The character is also modified by other factors but these are without effect in the presence of the normal allelomorph of the blotch gene.—*D. F. Jones.*

2515. FICK, RUDOLF. Weitere Bemerkungen über die Vererbung erworbener Eigenschaften. [Further remarks on the inheritance of acquired characters.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 31: 134-152. 1923.—The author recalls the hypothesis of the "progene," or stepping stone to the gene, developed in a previous paper to account for the inheritance of acquired characters. Dürken has elaborated this idea, thinking of the "progene" as at first only "plasmatic" and later by summation effecting a mutation. Bromann is mentioned as opposing the author's "progene" hypothesis, and a paper by Stieve is discussed, who assumes equal influence of environment on soma- and germplasm to account for inheritance of acquired characters. The author distinguishes between inherited occurrence of somatic change occasioned by causes not originally in the germplasm, and mutations, arising from changes in germplasm. He regards mutations as independent hereditary mass changes, distinct from inherited acquisitions dependent on changes in somaplasm. The possibility of a variation must be present in the germinal constitution before it can appear as an inherited acquired character. He considers it entirely possible that local acquired changes by production of enzymes circulating in the blood stream may immediately effect changes in germplasm. This enzyme or stimulating substance produces in the germplasm a localized chemical change. Such changes accumulated through generations eventually effect visible change in an organism. The author endeavors to apply this hypothesis in cases of joints of certain amphibians and certain skin thickening in the hands of man.—*Helen D. Hill.*

2516. FRATEUR, J. L. New forms in the first generation of animals. *Internat. Rev. Sci. and Practice Agric.* 1: 43-48. 1923.—New types of animals and plants (genotypes) are produced in F_2 where the parents differ in 1 or more pairs of Mendelian factors. The formula 2^n-2 represents the appearance of new types in F_2 , N representing the number of differential Mendelian factors in the 2 parent types. New types may appear in F_1 either as intermediate forms or as new forms. Blue color resulting from mating white and black fowls together represents the 1st type. The appearance of agouti in F_1 from black and albino parentage illustrates the 2nd type.—*F. A. Hays.*

2517. FROST, HOWARD B. **Heterosis and dominance of size factors in *Raphanus*.** *Genetics* 8: 116-153. 10 fig. 1923.—Both wild and cultivated races of radish (*Raphanus*) proved to be highly heterozygous. Self-fertilization for 2 generations isolated conspicuously different lines which were often markedly deficient in vigor. Crosses between such lines were very vigorous, large, and early-flowering, compared with their parents. Extensive segregation and recombination occurred in F_2 with increase in variability and decrease of average size. Self-sterility was found, especially in wild races. Evidence favorable to the dominant factor hypothesis of heterosis was found as follows: (1) abnormal characters are due to recessive genes; (2) biologically superior types depend largely upon dominant genes; (3) the biologically inferior condition of thickened roots tends to disappear in escapes from cultivation; (4) different F_1 individuals, in crosses involving many genotypic differences, transmit markedly different degrees of vigor; (5) certain size and habit differences are due to single genes which in one case show linkage.—D. F. Jones.

2518. GARRETT, F. C., AND J. W. HESLOP-HARRISON. **Melanism in the Lepidoptera and its possible induction.** *Nature* 112: 240-241. 1923.—This is a preliminary report on experiments to determine whether food plants growing in the industrial regions of North England and the salts of metals likely to be found upon them will induce melanism in moth stock, imported from southern counties and free from melanism. *Tephrosia crepuscularia* from Kent, fed for 3 generations on roadside hawthorn at Birtley (Durham, North England) produced 1 black female in a brood of 23 moths. Melanism in this species is a Mendelian dominant. Four generations of *T. bistortata* showed no change, but in the 5th, 1 black female was obtained from about 90 pupae. Others of this 5th generation, cousins of those last mentioned, transferred in the egg to Hexham (Northumberland) where melanism is much less prevalent than at Birtley, were divided into 4 lots, 1 of which was fed on local hawthorn, the others on hawthorn impregnated with a metallic salt. One or 2 black moths appeared in each culture among an average of 24 individuals.—*Selenia bilunaria*: The 2nd generation of stock from Kent fed on roadside hawthorn at Birtley produced, besides many normal individuals, several melanic and 2 uniformly black. That black is recessive is suggested by the F_1 and F_2 generations from a black female \times a normal unrelated male. Two generations of Sussex (non-melanic) stock were reared at Birtley and sent to Hexham, where they were fed on hawthorn treated with lead nitrate and magnesium sulphate. The resulting spring brood showed no melanism, but pairing occurred and a summer generation was raised under the same treatment. A control batch of this generation (12 moths) likewise showed no melanism, but a single strongly melanic male appeared in each of 2 sections fed on leaves dosed with lead nitrate (12 σ^7 , 15 ϕ^7 ; 20 σ^7 , 11 ϕ^7); while a 4th section under treatment with a manganese salt gave 6 σ^7 and 2 ϕ^7 that were black, and none of the remaining 5 σ^7 and 7 ϕ^7 was quite typical. Mr. and Mrs. Garrett, continuing their experiments on the effect of lead salts (which had accelerated growth and increased pupal weight in *Smerinthus ocellatus*), found that in *Amorpha populi*, also, the larvae fed up more rapidly, but the pupae were 15 per cent lighter than the controls. The moths showed a tendency toward melanism, the colors and markings being distinctly more intense.—J. H. Gerould.

2519. GATES, R. R. **The chromosomes of a triploid *Oenothera* hybrid.** *Ann. Botany* 37: 565-569. 1 pl. 1923.—One plant was raised from a cross between the diploid race of *O. Lamarckiana* with red calyx (rubricalyx) and a tetraploid strain, presumably from *O. Lamarckiana*. The red calyx is said to be dominant in crosses with diploids; but the red was much diluted in this F_1 plant. Two pollen-mother-cells showed 21 chromosomes. In 3 other pollen-mother-cells illustrated there were detached chromosomes at the 2nd division. In the 2 remaining cells, and in some other cells not shown, several chromosomes are said to have been missing. Only 1 in 5 of the pollen-grains appeared good.—John Belling.

2520. GATES, R. R. **The trisomic mutations of *Oenothera*.** *Ann. Botany* 37: 543-563. 1 pl. 1923.—In an F_1 of 53 plants of a cross between *O. Lamarckiana* form rubricalyx) and *O. Hewetti* there were 2 similar plants, 1 of which had 15 chromosomes. Ten of these chromosomes were seen to be in pairs at the late prophase. Some detachment of chromosomes was observed at the 1st division. There follows a discussion of the forms of *O. Lamarckiana*, etc., in which 15 chromosomes have been demonstrated, or presumed to exist. It is said that

"forms with aberrant chromosome numbers make up the great majority of *Oenothera* mutants."—*John Belling*.

2521. GERBAULT, E. L. *Hérédités chez la Cymbalaire*. [Heredity in the *Cymbalaria*.] Bull. Soc. Linn. Normandie 5: 3-9. *Illus.* 1922.—*Luilaria Cymbalaria* Mill. *globosa* Hort. is a fixed commercial variety. While attempting to determine its origin the author made crosses with other varieties of *L. Cymbalaria*, coming to the conclusion that the unbranched form (*globosa*) is due to a single Mendelian factor. This also applies to other varieties of *L. Cymbalaria*.—*Charlotte Elliott*.

2522. GÉRÔME, JOSEPH. *Au sujet des plantes à fleurs doubles*. [On the subject of double-flowered plants.] Jour. Soc. Nat. Hort. France 24: 143-153. 1923.—The author gives 2 lists of plants that have given double-flowers: (A) indigenous European species, (B) introduced ones. Dates of appearance of doubleness are included. In discussing possible causes of doubleness he considers that length of cultivation, seed reproduction, and hybridization have favored appearance of double-flowered varieties.—*J. P. Kelly*.

2523. GOODACRE, W. A. *The queen bee competition at Wauchope*. Agric. Gaz. New South Wales 34: 831. 1923.—In a comparative study of vigor of bee colonies it was evident that some colonies had better wintering capacity than others, apparently due to the germinal influence of the queen. It is possible by selective breeding to produce better wintering strains of bees.—*L. R. Waldron*.

2524. GREGORY, R. P., D. DE WINTON, AND W. BATESON. *Genetics of Primula sinensis*. Jour. Genetics 13: 219-253. 8 pl. 1923.—Ratios of offspring from back crosses involving certain linked characters differ somewhat according to whether the heterozygote is used as the male or the female. In 1 case, involving 2 pairs of linked characters, there is a smaller proportion of cross-over classes when the female is the heterozygous parent; in another, involving 2 other pairs of linked characters (but of the same linkage group as the 1st 2), there is a smaller proportion of cross-over classes when the male is used as the heterozygous parent. The genes involved in the 1st case are: short style (*S*) and blue (*B*, necessary for magenta flower color) dominant to long style (*s*) and no blue (*b*). The total data for female parent heterozygotes are: *SB*, 1,668; *Sb*, 148; *sB*, 128; *sb*, 1,703. For male parent heterozygotes the total data are: *SB*, 1,503; *Sb*, 194; *sB*, 209; *sb*, 1,380 (7.5 per cent and 12.5 per cent of the offspring are cross-overs when the female and male parent respectively is used as the heterozygote). In the 2nd case the genes involved are: green stigma (*G*) and light reddish stem (*L*), dominant respectively to red stigma (*g*) and deep red stems (*l*). The total data for female parent heterozygotes are: *GL*, 720; *Gl*, 21; *gL*, 26; *gl*, 669. For male parent heterozygotes the total data are: *GL*, 1043; *Gl*, 19; *gL*, 20; *gl*, 999 (3.2 per cent and 1.8 per cent of the offspring are cross-overs when the female and male parent respectively is heterozygous). The authors interpret their data as proving that linkage strength varies in the male and female, and believe that this militates against the chromosome hypothesis. They state that the pollen grains, as shown by microscopic examination, seem all to be viable. To a 2nd linkage group (separate from the 1 formed of the above-mentioned genes) belong flat leaf (*F*) and *sinensis*-shaped corolla and calyx (*Ch*), dominant respectively to crimped leaf (*c*) and stellate corolla (*ch*). Various other crosses are recorded in the paper. In some there were significantly large departures from the expected ratios. The authors have observed, in rare instances, mosaics, involving characters for which the plants were heterozygous. In one instance a plant appeared with 2 flowers, each a mosaic for 2 linked characters; a deep red magenta plant with green stigma had a stripe of deep red, a color seen only in plants with red stigmas. No evidence is given that the plants were genetically mosaic. From a consideration of the horticultural history of *Primula sinensis* it seems that most of the new varieties including 2 dominants (white petals and white eye) have arisen by mutation since the introduction of the plant in about 1819 from China.—*Edgar Altenburg*.

2525. HABERLANDT, G. *Über Zellteilungshormone und ihre Beziehungen zur Wundheilung, Befruchtung, Parthenogenese und Adventivembryonie*. [Cell-division hormones and their relations to wound repair, fertilization, parthenogenesis and adventive embryogeny.] Biol. Zentralbl. 42: 145-172. 9 fig. 1922.—Results of some 20 years' investigations are embodied in this article and used, along with researches from other workers, in developing the hy-

pothesis of hormone formation in plant cells. Evidence is presented for the existence of 3 classes: (1) hormones of embryos and of primary meristem, (2) hormones of phloem tissue, and (3) wound- and necrohormones. The 2 hormones under (3) are similar except that the latter arise as a result of pronounced catabolic processes within cells not subjected to external injury, such catabolism often resulting in death of the cells.—Hormones under (3) act upon the fertilized egg cell leading to division and embryo development. Further, these hormones are responsible for parthenogenesis, apogamy, and adventive embryogeny, either natural or induced. A list of the author's summarized literature is included in the appended bibliography.—*L. R. Waldron.*

2526. HAECKER, V. Vererbungsgeschichtliche Einzelfragen V. Zur Frage der Lethalfaktoren. [Single genetic problems of importance. V. The problem of lethal factors.] Zeitschr. Indukt. Abstamm.-u. Vererb. 32: 74-81. 1923.—The author attempts to account for the results obtained by Winge (*Genetica* 4: 321-338. 1922) with a balanced lethal stock of *Drosophila*. Interpretation is based on selective fertilization. The author states that he has been unable to see the numerous American papers on balanced lethals, and was evidently also not acquainted with Mohr's comment (see Bot. Absts. 12, Entry 4001) on Winge's work.—*A. H. Sturtevant.*

2527. HAECKER, V. Weitere phäno-genetische Untersuchungen an Farbenrassen. [Further pheno-genetic investigations of color races.] Zeitschr. Indukt. Abstamm.-u. Vererb. 32: 70-73. 1923.—Albinism is caused in axolotl by an inhibition which prevents the necessary chemical combinations for pigment development. Climatic conditions are thought to modify the lipochromes, melanoproteins, and melanic pigments in different species. Different colors in poultry and sheep are brought about by difference in color of pigment and shape of pigment granules. Both latitude and temperature appear to influence species color. Birds and animals from polar regions probably do not assume new color characteristics when taken to the tropics.—*F. A. Hays.*

2528. HANSEN, W. Der Terminkalender für die Mahndorfer Pflanzenzucht. [The term calendar of the Mahndorfer Plant Breeding Institute.] Zeitschr. Pflanzenzucht 8: 462-470. 1922.—The work of the Mahndorfer Plant Breeding Institute is systematically arranged, each part to be completed within periods divided not according to months of the year but according to more or less elastic working periods—the winter work (Nov.-Jan.), the work of the early part of the year, spring work, early summer, summer, preparation for harvest, harvest, post harvest, autumn work. These 9 periods form the term calendar and under each is listed in detail the work to be accomplished during that time.—*Charlotte Elliott.*

2529. HARRINGTON, J. B., AND O. S. AAMODT. The mode of inheritance of resistance to *Puccinia graminis* with relation to seed color in crosses between varieties of Durum wheat. Jour. Agric. Res. 24: 979-996. 3 pl. 1923.—The authors studied the reaction of F_3 families of 2 *Triticum Durum* crosses to certain specialized races of *Puccinia graminis*. F_3 families of Kubanka 8 \times Pentad were tested with a specialized race to which Kubanka 8 was susceptible and Pentad resistant. The families were classified as resistant, near-resistant, heterozygous, near-susceptible, and susceptible. The ratio of resistant to the other families was 1:22.4.—The presence of 2 factors appeared to explain the results. F_3 families of Mindum \times Pentad were tested with 2 races towards which the 2 parents behaved reciprocally. With 1 race a ratio of 49.5 immune families to 166 more or less susceptible was found. This suggests a single differential factor. With the 2nd form the number of resistant families was too small to indicate definitely the presence of a single factor difference but this is suggested. Six F_3 families were resistant to both races and possibly 2 differential factors may explain these results. If present they are inherited independently, which makes possible the combining of resistance to both forms in a single variety. No relation was found between seed color and rust resistance.—*George M. Reed.*

2530. HARRIS, J. A., AND H. R. LEWIS. Biometric considerations on the inheritance of fecundity in the White Leghorn fowl. Poultry Sci. 2: 65-74. 2 fig. 1923.—Annual records of 412 daughters and 287 dams, all white Leghorns, made at the Vineland Contest are studied. The correlation between mother and daughter in pullet-year production was 0.1279 ± 0.0331 . The correlation between mother's 2nd-year and daughter's pullet-year production was 0.1961

± 0.0323 . The coefficients are small but probably significant. These studies point to some advantage in selecting pullets from dams with high egg records alone.—*F. A. Hays*.

2531. HAYES, H. K., AND O. S. AAMODT. **A study of rust resistance in a cross between Marquis and Kota wheats.** Jour. Agric. Res. 24: 997-1012. 3 pl. 1923.—The authors studied the reaction of F_3 families of Kota \times Marquis wheat to 2 specialized races of stem rust. Kota was susceptible to 1 race and immune to the other; Marquis was resistant to both races. Immunity is clearly dominant over resistance or susceptibility. With 1 race the results could be explained on the basis of 2 independently inherited factors for immunity and resistance contained in the Kota and Marquis parents respectively. With the other race the evidence indicated that there are several genetic factors which determine the differential reactions of Marquis and Kota. There is no close linkage in inheritance of factors for the presence or absence of awns or seed length with those which determined resistance. Resistance of 1 parent to 1 race and the immunity of the other parent from another race can be combined in a single hybrid family, which suggests that resistance to all specialized races can be obtained.—*George M. Reed*.

2532. HENDERSON, JAMES. **On expansions in tetrachoric functions.** Biometrika 14: 157-185. 7 fig. 1922.—Any function the successive moments of which can be integrated can be expanded as series of tetrachoric functions or derivatives of normal curve. This is essentially Charlier's method of deriving skew frequency curves. For Pearson's Types I and III the tetrachoric expansions do not converge satisfactorily. It is concluded that such series are probably not suitable to represent skew frequency distributions in general, though they may fit distributions close to normal.—*John Rice Miner*.

2533. JENNINGS, H. S. **Inheritance in unicellular organisms.** 2nd Internat. Congress Eugenics. Vol. 1. Eugenics, genetics and the family. 59-64. Williams & Wilkins Co.: Baltimore, 1923.—Unicellular organisms reproduce for thousands of generations from a single parent, without the kaleidoscopic regrouping of the hereditary substances which complicate inheritance in higher animals with biparental reproduction. A race of such unicellular organisms shows great constancy in its hereditary constitution. Characteristics of Protozoa may be determined by the hereditary constitution, or be independent of it. In some cases slight hereditary differences may be established in long continued selections for characteristics which are at first apparently not heritable. The cause of this is unknown. In the more complex unicellular forms hereditary changes resulting from environmental action appear rare or almost absent. In the lower forms, particularly the bacteria, this type of change appears to be rather common, and adaptive in character; although this conclusion is rendered somewhat uncertain by the great difficulty in determining critically the facts.—*J. Lincoln Cartledge*.

2534. JIVANNA RAO, P. S. **A note on pollen sterility and the shedding of bud and fruit in *Thespesia populnea*.** Year Book Madras Agric. Dept. 1922: 23-27. 1923.—*Thespesia populnea* is not known in the wild state in South India. Some trees (from cuttings) shed most of their young fruits, while others (probably from seed) produce an abundance of fruit. The 2 types show morphological differences also. In trees from cuttings a large percentage of the pollen is defective. This is thought to be due to excessive vegetative development.—*Winfield Dudgeon*.

2535. JIVANNA RAO, P. S. **An enquiry into the cause of bud and boll shedding in cotton.** Year Book Madras Agric. Dept. 1922: 1-23. 3 fig. 1923.—This study was made at Coimbatore, South India, on *Gossypium herbaceum*. Cross pollination is thought to prevail, largely through the agency of bees (*Anthophora cingulata* and 2 species of *Halictus*). Flowers with perfectly sound pollen are rare. Pollen grains vary widely in their osmotic pressures; most of them burst almost immediately in water. Stigmas appear to be receptive as soon as the flowers open, and lose their receptivity shortly after noon. No evidence for ovule sterility was found. Shedding of buds occurs "only in the earlier stages of floral development when the growing parts (of the bud) are in a low state of osmotic activity," probably because higher osmotic pressures in the vegetative parts of the plant cause withdrawal of the water from the buds. Shedding of unpollinated ovaries begins about 4 days after the flowers open. Anything, especially failure in fertilization, that arrests development of the ovules causes shedding of bolls. Fertilization probably fails because of lack of adjustment of osmotic pressures between the stigma and the pollen grains.—*Winfield Dudgeon*.

2536. JUST, GÜNTHER. *Lethalfaktoren beim Menschen? [Lethal factors in human beings.]* Zeitschr. Indukt. Abstamm.-u. Vererb. 31: 352-357. 1923.—A critique is submitted of a paper by Little and Gibbons where evidence was presented to show the existence of lethal factors in the sex chromosomes of certain human strains as revealed by abnormal sex ratios in families showing color-blindness and haemophilia. In Little and Gibbons' data the sex ratio was found to be high and the relative number of affected males in excess of expectation. The author suggests that the aberrant ratios may be largely or wholly due to statistical error in sampling and supports his contention by a series of experiments with a sex-linked trait (white eye color) in *Drosophila* families. In these cultures, where there is no lethal factor involved, if conditions are made to simulate those which obtain in human affairs, somewhat similar aberrant ratios are obtained, but in these cases they are demonstrably due to the statistical procedure.—*C. H. Danforth.*

2537. KEMPTON, J. H. *Inheritance of dwarfing in maize.* Jour. Agric. Res. 25: 297-321. 5 pl. 1923.—In the F_1 of crosses between andromonoecious dwarf and brachytic maize plants normal stature is restored; and from the behavior of the F_2 it seems clear that these are independent variations both expressed in reduced stature, the genes for which are located in separate chromosomes. The double recessive combination in this hybrid is not strikingly different from the andromonoecious parent. From a consideration of the general features of these variations it is suggested that in maize at least several and possibly all the chromosomes are identical.—*J. H. Kempton.*

2538. KLEINER, W. *Über den grossen schweizerischen Stammbaum, in dem mit Kurzsichtigkeit kombinierte Nachtblindheit sich forterbt. [Concerning a large Swiss family tree in which near-sightedness combined with night blindness is inherited.]* Arch. Rass.- u. Ges. Biol. 15: 1-17. 3 pl. 1923.—In this family, with records going back to the 16th century, nightblindness is regularly associated with near-sightedness frequently combined with astigmatism. Extreme near-sightedness does not exist. Nystagmus does not occur in most cases and the posterior regions of the eyes are without pathological changes.—*Robert T. Hance.*

2539. KRANTZ, F. A. *Permanence of variety in the potato.* Jour. Agric. Res. 23: 947-961. 1 pl. 1923.—The author reports the result of 4 years' work in Minnesota with 7 lots of Early Ohio potatoes, obtained from different regional sources. Two of the lots had been mass selected for at least 20 years. These lots were grown in comparison with each other in 2 or more places each year. Plots were located at University Farm, Duluth, Grand Rapids, and Crookton. From 1 to 34-row plots were used. Comparisons were made with respect to productivity, form of tuber, formation of knobs of tubers, fissures or crevices in tubers, depth and prominence of eyes, surface of skin, and tuber color. Measurements of tubers were made and the correlation between length and width of tubers used as an expression of form. No differences could be ascertained between the 7 lots when grown under the same conditions. Since the different lots had been obtained from different environments and 2 of them subjected to mass selection for 20 years, the author concludes that potato varieties are relatively stable under vegetative propagation and that the main value of individual hill and tuber-unit selection lies in the elimination of varietal mixtures and disease.—*C. H. Myers.*

2540. LAUGHLIN, HARRY H. *Analysis of the mental and dross in America's modern melting pot. Hearings before the Committee on Immigration and Naturalization, House of Representatives, 67th Congress, 3rd Session, Serial 7-C, p. 725-831, Nov. 21, 1922.* Government Printing Office: Washington, 1923.—The total population of 445 state and federal custodial institutions is compared with that of the country as a whole (1910 census) with reference to the relative number of natives, immigrants, natives of foreign-born parentage, etc. The number of feeble-minded, insane and epileptic in these institutions is especially considered along with some analysis of the distribution of tuberculosis, syphilis, blindness, deafness, and other disabilities. Results of the study are set forth graphically in a series of charts, and supplemented by appendices giving detailed statistics and discussion of statistical methods employed. As a whole, immigrants are found in custodial institutions considerably in excess of what should be expected on the basis of their numbers in the general population, but those coming from different parts of Europe differ considerably in various particulars, those from southern and eastern parts making the poorest showing in most respects. The immigrants themselves make a fair

showing as regards feeble-mindedness and physical disabilities since, owing to the U. S. A. immigration laws, they represent in these respects a more or less selected group. Among their offspring the case is quite different, which emphasizes the important fact that the immigrant passed purely on his individual rating is on the whole likely to be better phenotypically than genotypically. "Racially on the average a sound family is a much sounder eugenical unit than a sound individual without family history."—*C. H. Danforth.*

2541. LA VAULX, R. DE. Sur l'apparition d'intersexués dans une lignée de *Daphnia magna* (Crustace cladocere) et sur le déterminisme probable du phénomène. [On the appearance of intersexes, and the probable cause, in a line of *Daphnia magna*.] Compt. Rend. Acad. Sci. Paris 174: 1740-1742. 1922.—Experiments are summarized in which living conditions, food water, and temperature of the animals were varied. The opinion is given that the production of the intersexes may result from a poisoning of the ovaries due to an accumulation of excretion products in the medium, since intersexes, abortive eggs, and atrophied individuals appeared only after the parent animals had remained in the same medium for a certain length of time. Further experiments are necessary to verify this theory.—*J. L. Collins.*

2542. LIEBENDÖRFER, TH. Über Erbliehkeitsverhältnisse bei Fettsucht. [Inheritance relation of obesity.] Arch. Rass.- u. Ges. Biol. 15: 18-23. 1923.—In this analysis of the distribution of obesity among the relatives of 25 patients whose excess weight could not be accounted for by personal habits or environmental factors, the condition is found to be hereditary, and apparently dominant, although it occasionally skips a generation. It is suggested, however, that there may be several different obesity factors, all dominant.—*C. H. Danforth.*

2543. LINDFORS, T. Om pollination och fruktsättning hos Gravensteiner och Åkerö. [Pollination studies with Gravenstein and Åkerö apples.] K. Landtbr. Akad. Handl. och Tidskr. 61: 233-237. 1 fig. 1922.—The writer found the Gravenstein and Åkerö varieties practically self-sterile. In 1 test a certain branch of Gravenstein set fruit while the remainder of the tree was self-sterile. As 90 per cent of Åkerö pollen germinated, its sterility was due to incompatibility. In cross-pollination tests the Sävstaholms proved to be the best pollinizer for Gravenstein and Keswick Codlin for the Åkerö. The percentage of fruit retained by individual flowers and flower clusters was calculated each month and it was found that the different varieties used as pollenizers behaved very differently in their ability to make fruits hang to the tree throughout the season.—*Olav Einset.*

2544. LINDSTROM, E. W. Corn breeding. Wisconsin Agric. Exp. Sta. Bull. 356. 38 p., 10 fig. 1923.

2545. LINDSTROM, E. W. Genetical research with maize. Genetica 5: 327-356. 1 fig. 1923.—A summary is presented of the genetical research in maize, including a list of the known factors and the present status of knowledge of the linkage groups. Unpublished data by E. G. ANDERSON on the pericarp color and by G. N. STROMAN on the genetic relations of chlorophyll and anthocyanin seedling characters are abstracted briefly.—Several typographical errors have been made which the author has corrected in the reprints as follows: *p. 343* chromosome map I, *Ic* should read *IC*. *p. 347* map II and III, the recessive allelomorphs omitted, map IV, the recessive allelomorph of *Lg* and *B* omitted. *p. 348*, map V the dominant *V* omitted, map VI should read *V*, and *WL* and *wl* should read *W_l* and *w_l*, map VII on this page should read *VI* and the recessive allelomorphs are omitted; text, *p. 348* *W_l* Anderson should read *W_l*, *p. 349* map VII, recessive allelomorph omitted. *p. 351*, list of factors flowery-flinty endosperm should read flowery endosperm. *p. 352*, *rs* spotted aleurone should read *s*-spotted aleurone, and the small case *e* following tassel ear and tassel seed deleted.—*J. H. Kempton.*

2546. LOEWENTHAL, HANS. Cytologische Untersuchungen an normalen und experimentell beeinflussten Dipteren (*Calliphora erythrocephala*). [Cytological investigations upon *Calliphora erythrocephala* under normal and experimental conditions.] Arch. Zellforsch. 17: 86-101. 10 fig. 1923.—By starvation the larval period was shortened by $\frac{1}{4}$ or $\frac{1}{3}$; these larvae, though healthy, were decidedly smaller. The mass of a normal pupa is many times that of a starveling. The cells of a stunted larva are small and proportionate to the size of the body, but cells of primordia of adult organs in a stunted larva are of normal size, e.g., ovary, in which there were fewer cells and fewer egg tubes, and cells of small starved adults are likewise normal in size. That is, growth of the larva from a few mm. to 2 cm. in length consists

(except for the insignificantly small imaginal primordia) in the increase in the size of cells already formed. Body size in general is determined by the number of cells rather than by their size. Variation in the size of cells plays an important part only in those tissues the cells of which early become differentiated and cease to divide. Exposure of pupae for several hours to cold (-11°C . minimum), or for 2 hours to heat (42°C . maximum), or repeated narcotising with ether or alcohol, or extending pupal life from 14 days to 3 months by exposure to cold, gave negative results. Germ cells and soma developed, or were arrested, equally; no artificial paedogenesis by heat and no wing modifications were produced. Diptera, not being subject to modification, are not adapted to throw light on the problem of the origin of species, save that the retrogressive mutations in *Drosophila* may serve as the basis of new species of a lower type of differentiation.—*J. H. Gerould*.

2547. MACBRIDE, E. W. **Dr. Kammerer's experiments.** *Nature* 111: 841-842. 1923.—The author replies to criticisms by Cunningham [see Bot. Absts. 13, Entry 1560] and Bateson [see Bot. Absts. 13, Entry 1547]. As to the relation between location of nuptial pad and part of hand in contact with body of female Alytes, the primary contact according to Boulenger takes place neither with the dorsal nor ventral surface of the hand but with the radial edge.—*Fred N. Briggs*.

2548. MACBRIDE, E. W. **The present position of the Darwinian theory.** *Sci. Progress* 69: 76-96. 1923.—Darwin's statements on variation are summarized. The material on which natural selection acts involves either the inheritance of the effects of use and disuse or an indefinite tendency to vary to an unlimited extent in all directions, each individual variation being small. The author refers to the various pure line investigations as bearing on the doctrine of indefinite variability. Darwin rejected mutations as possible material for evolution because of their rarity. The writer believes that this combined with the general nature of mutations, as mainly of the recessive type in crosses or monstrous in character, preclude their acceptance as material upon which natural selection may work. The work of Kammerer and others is discussed in which exposure to new conditions induces changes which are to a certain extent inherited. The author takes up the question of the origin and distribution of local races; he believes that environment is the cause of variability acting directly by alteration of habits and consequent modification of structure with subsequent inheritance of these.—*George M. Reed*.

2549. MALLOCH, WALTER SCOTT. **The problem of breeding nematode-resistant plants.** *Phytopathology* 13: 436-450. 2 fig. 1923.—In the process of breeding desirable varieties of plants resistant to nematode (*Heterodera radicicola*) it is highly desirable that at least 1 of the parents be resistant and that the source of this resistance be known. Various cultural methods of growing plants and nematodes together for a study of resistance are discussed. Following this a list of species and varieties of plants used in successful cross inoculations is given. Apparently there are no distinctly differentiated strains of the nematode. All of the 67 varieties of canteloupe (*Cucumis melo*), and the 98 varieties and 8 hybrid tomatoes tested were found susceptible to infection.—*B. B. Higgins*.

2550. MAVOR, J. W., AND H. K. SVENSON. **X-rays and crossing-over.** *Science* 58: 124-126. 1923.—X-rayed females of *Drosophila melanogaster* showed an increased amount of crossing over for the black purple and purple curved regions in the 2nd chromosome. The effect appeared at least as early as in eggs laid 6 days after treatment, reached a maximum in eggs laid 7-9 days after treatment, and then fell off gradually. A 3-minute treatment with X-rays gave effects on crossing over in eggs laid over a period of at least 11 days. The authors compare their results with Plough's studies of the effects of temperature on these same regions, and with Mavor's earlier result that X-rays decrease the amount of crossing-over between eosin and miniature in the 1st chromosome of *Drosophila*.—*A. H. Sturtevant*.

2551. MENDIOLA, NEMESIO B. **Methods of plant breeding in general.** *Philippine Agric. Rev.* 16: 30-45. 1923.—An outline and brief discussion is submitted of the usual methods of selection and hybridization, and of the distribution of improved varieties. For Philippine conditions, large-scale governmental distribution of improved varieties is favored.—*Howard B. Frost*.

2552. METZ, C. W. A note on the effects of temperature on the mutant characters "bent" in *Drosophila virilis* and *Drosophila melanogaster*. Proc. Soc. Exp. Biol. and Med. 20: 305-310. 1923.—The character "bent" in *D. melanogaster* shows considerable variability at normal temperature especially in the wings and in the degree of shortening and twisting of the legs. A probably homologous character in *D. virilis* shows similar variability, but in addition a slight speckling of the eyes. Cultures of the "bent" *D. melanogaster* bred at low temperature (9-12°C.) show the speckling characteristic of *D. virilis* "bent" at normal temperature, while the latter in the cold shows this feature much emphasized. This and similar effects give added reason for believing that the 2 mutations are homologous.—H. H. Plough.

2553. MIYAKE, KIICHI, AND Y. IMAI. On the inheritance of flower-colour and other characters in *Digitalis purpurea*. Jour. Coll. Agric. Imp. Univ. Tokyo 6: 391-402. 1 pl. 1920.—Cultivated *Digitalis* is mostly heterozygous. The authors' incidental study of hairiness of stem confirms Miss Saunders' work. Green stem is recessive to colored stem. Colored stems produce either purple or white flowers, with red spots, while green stems produce white flowers with yellow spots. The flowers concerned in this experiment were white with yellow spots, white with red spots, and purple with red spots, the last 2 always having anthers speckled with red dots. Keeble, Pellew and Jones are cited as finding a dominant white *W* inhibiting the expression of the color magenta *M*, with the darkening factor *D* converting magenta to purple. The authors, however, found that all whites are recessive to color. They assume factors, *C*, *c*, *P* and *p*, with *C* dominant, as responsible for purple in the stem, corolla spots, and anther dots. The factor *c* is responsible for yellow corolla spots in white flowers. *P* expresses itself as purple corolla, but is effective only in the presence of *C*. The *CcPp* genotype gives upon segregation an imperfect approximation to a 9:3:4 ratio. The results of Keeble *et al* are explained without assuming a white dominant.—J. Ben Hill.

2554. MOL, W. E. DE. Duplication of generative nuclei by means of physiological stimuli and its significance. Genetica 5: 225-272. 6 pl. 1923.—Diploid pollen grains were obtained in diploid plants of *Hyacinthus orientalis*. The occasional doubling of the chromosome number and formation of multinucleate pollen grains is attributed to the physiological effects of shortening the growing season by harvesting the bulbs before they are ripe or by cutting off the leaves. The author also suggests that duplication of chromosomes in sexual nuclei in *Oenothera* may be due to the shortening of the vegetative period. Pollination of a diploid variety with a variety having diploid pollen grains resulted in 5 triploid seedlings among many diploid ones. Dutch hyacinth growers have unconsciously applied the same methods of propagation which induce formation of diploid pollen grains and it is significant that triploid varieties have been developed by breeders.—Karl Sax.

2555. MOTTET, SERAPHIM. Notes sur l'origine, l'évolution, et la culture des iris des jardins. [Notes on the origin, evolution and culture of garden Irises.] Jour. Soc. Nation. Hort. France 24: 323-330. 1923.—The author reviews the history of the older varieties of tall bearded Iris and the relation of the various so-called species of this group of Irises. He states briefly the origin of the more recent varieties involving the crossing of *Amas*, *cypriana*, *Ricardi*, *troyana* and other large flowered types from western Asia, with the older types.—George M. Reed.

2556. NILSSON-LEISSNER, G. Berättelse över försöksverksamheten vid Deutsch-Swedish Saat zuchtanstalt, Derenburg am Harz 1920-1922. [Report on the activities of the German-Swedish seed breeding station at Derenburg in Harz, 1920-22.] Sver. Utsädesfor. Tidskr. 32: 312-325. 2 fig. 1922.—This paper contains a report on the experimental work carried on at the above mentioned stations and at local substations Trebnitz, (Könnern, Salle) and Hüttenrode in Harz. The work was planned cooperatively between the Swedish Seed Association (Sverges Utsädesförening), Svalöf, and its representative in Germany, Chr. Kricheldorf, Derenburg in Harz. The aim is to compare the older and newer varieties produced at Svalöf with the best native German varieties. At Derenburg breeding work, chiefly with material from Svalöf, is carried on. Besides those mentioned, experimental work is also carried on at München, Bavaria. Experimental work is in progress with the following crops: spring and winter wheat, winter rye, summer and winter barley, summer and winter oats, peas, vetch, fodder and sugar beets, rape, flax, and grasses.—A. P. Lunden.

2557. PEARSON, EGON S. Natural selection and the age and area theory of Dr. J. C. Willis. *Biometrika* 15: 89-108.—This article is a critical examination of some of the statistical evidence presented by Willis in support of his age and area hypothesis. The author points out from general considerations that certain relations between endemic and wide species are not inconsistent with the theory of natural selection. The observed fact from examination of Ceylon and New Zealand distribution that modal class for wide species lies in the common group and for endemics in the rare group is shown not to be inconsistent with the theory of natural selection. It is also demonstrated that many inconsistencies appear in examining the relation between endemics and "wides" in particular genera and families. According to the hypothesis of age and area, there should be a positive correlation between the range of a "wide" and the number of endemics, and between the range of a "wide" and the range of its most common endemic. Statistical examination of the evidence from Ceylon and New Zealand floras discloses no such relations. It is shown that the regular sequence of zonal distributions in the New Zealand flora may be accounted for on the basis of chance, from the assumptions that the centers of origin of species are distributed at random, that there is a characteristic frequency of distribution of range length, and that dispersal is not correlated with distance from ends. It is shown that Willis's contention that the frequencies of endemics fall off more rapidly from the zone of maximum frequency than that for "wides" is not supported by statistical examination of the evidence. The author concludes that the importance of age and area, size, and shape on distribution of Ceylon and New Zealand floras has been overestimated and that statistical evidence does not furnish a basis for rejecting the theory of natural selection.—*R. E. Clausen.*

2558. PEARSON, KARL. On the correction necessary for the correlation ratio η . *Biometrika* 14: 412-417. 1923.—The author further considers the effect of errors of sampling on the correlation ratio. The author concludes that $\frac{\text{observed } \eta - {}^2(\kappa - 3)/N}{1 - (\kappa - 3)/N}$ when K is the number of arrays involved in calculated η and N is the size of the sample, is a reasonable value for η^2 of sampled population, provided N is fairly large. If η is less than $\sqrt{(\kappa - 1/N + 1.7/\sqrt{N})}$, a significant association cannot be asserted.—*John Rice Miner.*

2559. PEARSON, KARL, AND ETHEL M. ELDERTON. On the variate difference method. *Biometrika* 14: 281-310. 2 *diagr.* 1923. (Appendix).—The authors consider the criticisms by Yule and Persons. Yule's conclusion that in differencing, short periodic term will swamp non-periodic fluctuations, is held invalid. Persons' criticism of "Student's" assumption that X_p and X_{p+s} , Y_p and Y_{p+s} , X_p and Y_{p+s} are uncorrelated is valid, and variate difference method is generalized to meet the objection. Applying the generalized method, correlation between death rates of 1st and 2nd years of life is reduced to -0.46 ± 0.08 for boys and -0.49 ± 0.07 for girls.—*John Rice Miner.*

2560. PEARSON, KARL, AND E. S. PEARSON. On polychoric coefficients of correlation. *Biometrika* 14: 127-156. 4 *diagr.* 1922.—Methods are developed for obtaining correlation coefficient from polychoric table on assumption of normal marginal frequencies (1) by equating product-moment of table to that of normal correlation surface, or (2) from the best fitting normal surface. Both methods give equations for determining r but the arithmetic is very laborious. In illustration both mean square contingency and correlation ratio from means of arrays give as accurate results as the more complex polychoric methods.—*John Rice Miner.*

2561. PEARSON, KARL, AND PERCY STOKES. On an unusual case of digital anomaly. *Biometrika* 14: 410-411. 5 *pl.* 1922.—A case is described of a woman having 5 perfect fingers but no thumb, on each hand. The woman had had 7 toes; the supernumerary ones were removed in infancy, and radiographs show the remnants of the bones of the extra toes. The 5-fingered condition proved no handicap to the woman in her trade of seamstress as she apposed 1 finger to the others in place of a thumb. No history of inheritance was known.—*Robert T. Hance.*

2562. PORTEUS, S. D. Studies in mental deviations. *xi + 276 p., 13 fig.* The Smith Printing House: Vineland, New Jersey, 1923.—Studies are reported of feeble minded patients without special reference to heredity, except that the estimated brain capacity of a group of 45 cases classed as hereditary, probably hereditary, and of neuropathic ancestry, averaged

1,335 cc. as compared with an average of 1,385 cc. for 20 cases in which the feeble-mindedness was probably due to other than hereditary causes. The author believes there is a decided relation between size of head and intelligence.—*C. H. Danforth.*

2563. PRELL, HEINRICH. *Die Theorie der Rhegmatypie.* [The "rhegmatype" theory. *Genetica* 5: 177-190. 4 fig. 1923.—The author bases his hypothesis on the assumption that the individual chromosomes may fragment and unite again during the life cycle of certain organisms. When fragmented parts of homologous chromosomes are exchanged at the reduction division, recombination of genes would occur, thus giving "crossovers." This hypothesis, which is called rhegmatypie, would explain linkage. The author thinks that linkage can not generally be explained by rhegmatypie. For certain organisms chiasmotypie could be accepted, and for others rhegmatypie.—*M. Demerec.*

2564. PRELL, HEINRICH. *Die Uniformität der Bastarde.* [The uniformity of hybrids. *Arch. Entwicklungsmech.* 52: 447-459. 1923.—The author discusses individual and serial uniformity in relation to the dictum that if the genotype and plastotype are similar the phenotype is also similar; or similar incepts under similar conditions lead to similar characters.—*John H. Schaffner.*

2565. PRELL, HEINRICH. *Zur Begriffsbildung in der Phänogenetik (II).* [Fundamental concepts in phaenogenetics (II).] *Arch. Entwicklungsmech.* 52: 450-479. 1923.—This is a discussion of the more obscure problems of genetics: the relation of heredity and hereditary factors to the chromosomes and other cell structures; environmental factors, genes, genotype, plastotype, phenotype, acquired characters, etc.—*John H. Schaffner.*

2566. REED, G. M. *Varietal resistance and susceptibility of sorghums to Sphacelotheca Sorghi (Link) Clinton and Sphacelotheca Cruenta (Kühn) Potter.* *Mycologia* 15: 132-143. 2 pl. 1923.—(1) Varieties of *Holcus sorghum* L. were tested as to resistance and susceptibility to covered kernel smut (*Sphacelotheca Sorghi* (Link) Clinton) and loose kernel smut (*S. Cruenta* (Kühn) Potter) by dusting the seed heavily with smut spores and planting in the experiment fields at Columbia, Missouri; Manhattan, Kansas; Amarillo, Texas; Arlington Experiment Farm, Virginia; and Brooklyn, New York. (2) Varieties of broom corn, kafir, shallu, sorgo and the common brown and white durra were quite susceptible to the covered kernel smut. Some recent introductions of white durra proved highly resistant. Dorso, Dwarf hegari, Kafrita and Sudan corn gave negative results. (3) Broom corn, kafir, durra, shallu and sorgo gave positive results with the loose kernel smut and feterita, milo, Dwarf hegari, and Dwarf Kaoliang gave negative results. (4) Strains at Dorso used were not infected with the covered kernel smut. Two of these selections were inoculated with the loose kernel smut and proved rather susceptible. (5) Observations were made at Amarillo, Texas, upon head smut (*Sorosporium Reihanium* (Kühn) McAlpine). No infections of broom corn, feterita and milo were observed. Brown durra, white durra, Black amber sorgo, Red amber sorgo, Coleman sorgo, Minnesota amber sorgo, Early Rose sorgo, and Schrock kafir were conspicuously susceptible to this smut. (6) The differences in pathological effects of the 2 kernel smuts of sorghum are described in detail.—*J. A. Faris.*

2567. RHODES, E. C. *On a certain skew correlation surface.* *Biometrika* 14: 355-377. 1 pl., 1 fig. 1923.—Numerous attempts have been made to develop a family of frequency surfaces which will extend the normal frequency surface as Pearson's curves extend the normal curve. The problem in general form has not yet been solved, but in this paper the author develops a special skew frequency surface which graduates very well the distribution of a particular numerical illustration, 2,922 daily observations of the barometric heights at Southampton and Landale. Since in this material the frequency was practically included between 2 straight lines a surface bounded by 2 straight lines was developed. The surface was fitted to the material, and the mid-ordinates computed and compared with the observed frequencies by the X^2 method.—*Sylvia L. Parker.*

2568. ROLET, ANTONIN. *De l'hybridization chez les Eucalyptus.* [Hybridization of the eucalypts.] *Parfum. Mod.* 16: 130. 1923.—The writer discusses pollination in the genus *Eucalyptus* and the possibilities of cross pollination. He names a number of intermediate species which are evidently the products of crosses between established species.—*Charlotte Elliott.*

2569. ROSSNER, FERDINAND. Untersuchungen über die Beziehungen zwischen Bestäubung und Blütendauer. [Investigations on the relation between pollination and flower duration.] Bot. Arch. 3: 61-128. 1923.—The author reports in detail the results of experiments with a large number of species, both mono- and dicotyledonous, to determine the effect of pollination on flower duration. In certain species pollination served to shorten the duration of flowers, while in others it was without effect. The species which gave evidence of shortening of flower duration due to pollination showed a similar effect from injury or removal of stigmas, while injury or removal of stigmas was without effect in those species in which flower duration was not effected by pollination. The author concludes that the effects, when present, are due to wound hormones activated by the passage of the pollen tube down the style, rather than to specific pollen hormones.—A. J. Mangelsdorf.

2570. SABNIS, T. S. Inheritance of variegation. Zeitschr. Indukt. Abstamm.- u. Vererb. 32: 61-69. 15 fig. 1923.—A study is reported of the grouping of cells in several green-and-white and yellow-green-white types of variegation in *Hydrangea hortensis*. The particular type of variegation in foliage is reported to depend upon the position of the buds with reference to distribution of green and of white blocks of cells in the vascular ring. How this variegation arises through cell lineage is regarded as a "mystery" but it is suggested that it "starts in a variegated cell in the meristem."—A. B. Stout.

2571. SALAMAN, R. N., AND J. W. LESLEY. Genetic studies in potatoes; the inheritance of immunity to wart disease. Jour. Genetics 13: 177-186. 1923.—Experiments are reported in which seed from hybrid and selfed potato plants was planted in soil thoroughly infected with *Synchytrium endobioticum* and the inheritance of resistance to the wart disease studied. The authors find: (1) that immunity to wart disease in the potato is dependent upon segregating factors; (2) that immunity is dominant to susceptibility, though this dominance may be inhibited by other factors; (3) that there are at least 4 types of immunes, which may be described as: (a) pure immunes, (b) immunes which on selfing give immunes and susceptibles in the ratio of 15:1, (c) 3:1, and (d) 9:7 respectively. The immunity these possess may be due to the presence of 1 or more immune factors, the evidence for the co-presence of at least 2 immune factors in some varieties being particularly strong. (4) The susceptibles may be of various sorts—(a) due to the absence of either of the immune factors *X* or *Y*, (b) due to the absence of the complementary factor *Z*, though either *X* or *Y* may be present, (c) due to the presence of an inhibitor of the immunity factor; (5) difference of genotype amongst immune plants is not reflected by any difference of degree in the immunity conferred. Difference of genotype, however, amongst susceptibles does appear to confer considerable differences in the degree of susceptibility. However, under the conditions of field experimentation the line between immune and susceptible once reached is absolute. (6) No differences were discovered as regards immunity in respect to reciprocal crosses; (7) there is no evidence of any relation or linkage between wart diseases and any other character of the plant.—J. A. Faris.

2572. SCHRADER, FRANZ. The sex ratio and oogenesis of *Pseudococcus citri*. Zeitschr. Indukt. Abstamm.- u. Vererb. 30: 163-182. 1923.—Experiments showed that these coccids, cannot reproduce parthenogenetically, the great excess of females found in nature being due to their greater conspicuousness and much longer life, and to the fact that the males, except in the last 2 instars, may easily be mistaken for females; the sex ratio of insects actually hatching is within the range of equality of the sexes. Oogonia show 10 chromosomes, primary oocytes, 5 tetrads. The nucleus of the 1st polar body remains in the egg without dividing; its 5 dyads later congregate with the 5 chromosomes of the 2nd polar body into 1 triploid nucleus at the egg periphery. This triploid nucleus divides slowly to form a layer of giant cells covering part of the side of the egg. Meanwhile the egg nucleus has fused with the sperm nucleus in the center of the egg and divided to form many small cells most of which migrate out to line the remainder of the egg periphery. The giant cells, their position encroached upon, migrate by amoeboid motion towards the symbiotic mycetocytes near the anterior pole, interdigitating among and enveloping them. Through aberrancies in mitosis they have now acquired 30 or more chromosomes and their nuclei are distinctive. They do not take part in other structures of the coccid. In contradiction to Shinji's description, the germ cells in the embryo arise from diploid cells of the germ band, derived from the fertilized egg nucleus. After the

revolution of the embryo, the gonad "anlagen" come to lie in contact with the symbiont-giant cell complex, and before the egg of the next generation is matured symbiont cells enter it but the neighboring giant cells do not.—*H. J. Muller.*

2573. SHAMEL, A. D. The improvement of sugar cane through bud selection. 66 p., illus. Exp. Sta. Hawaiian Sugar Planters' Assoc.: Honolulu, Hawaii, 1922.—This is a progress report of work by the Hawaiian Sugar Planters' Association from 1920 until June 1922, in sugarcane selection. Practical methods are described in detail for selection, handling "seed-pieces," planting, and studying the progenies in order to secure for propagation in field culture the strains most productive and free from disease. Bud sports are reported as frequent. Data are presented for 3 pedigreed clonal varieties 1 year old as to total weight, yield of sugar, length and number of stalks, and circumference per stool—with results that indicate that certain clonal strains are more uniform and stable than others.—*A. B. Stout.*

2574. SHULL, GEORGE H. Linkage with lethal factors in the solution of the *Oenothera* problem. 2nd Internat. Congress Eugenics. Vol. 1. Eugenics, genetics and the family. 86-99. Williams & Wilkins Co.: Baltimore, 1923.—The chromosomes of *Oenothera* behave as do those of other plants. Factors which differentiate the *Oenothera* species are located in a single chromosome pair, except that for the short style in *brevistylis*. Recessive lethal factors act as a mask behind which genetic change goes on; and alethal forms are usually less vigorous than the lethal-bearing types. Gamete lethals are peculiarly characteristic of the *Oenotheras*. It is held tentatively that the factors R^h for red hypanthia, R^s for red stem, R^c for red bud-cones, and r^c for green buds form a series of quadruple allelomorphs. Data are also presented to show that the n factor for nanella stature, s for sulphur flowers, and f for revolute leaves are in this same linkage group. In this chromosome pair *O. Lamarckiana* is heterozygous for l_1 and l_2 , 2 recessive lethals; while in *O. rubricalyx* and *O. erythrina* only 1 of this chromosome pair contains a lethal. Thus *rubricalyx* \times *Lamarckiana* gives 2 *rubricalyx* : 1 *Lamarckiana*, all heterozygous for bud-color. The F_1 *Lamarckiana* type plants, when selfed, give all F_1 type in F_2 . Their real heterozygous nature is shown in the back-cross to the *Lamarckiana* parent. From de Vries' data, *O. biennis* and *O. suaveolens* have the factors for sulphur and yellow flower color linked with a sperm and an egg lethal respectively. Cross-overs and all expected combinations may be obtained. Mass mutation is explained by crossing over of recessive genes at a distance from the masking lethals. *O. Lamarckiana* may or may not be of hybrid origin, but its genetic behavior is held to rest entirely upon its present factorial composition.—*J. Lincoln Cartledge.*

2575. STOCKS, PERCY. Facial spasm inherited through four generations. *Biometrika* 14: 311-315. 1922.—Thirteen individuals in 4 generations possessed a facial spasm. It is non sex-linked, transmitted through both sexes and also through unaffected females. There is a tendency for this abnormality to increase with succeeding generations.—*Robert T. Hance.*

2576. STROMAN, G. N. Sterility in rye. *Jour. Amer. Soc. Agron.* 15: 253-254. 1923.—Rye was found to be practically self-sterile.—*F. M. Schertz.*

2577. STURTEVANT, A. H. Inheritance of direction of coiling in *Limnaea*. *Science* 58: 269-270. 1923.—Direction of coiling in *Limnaea* may give a clear illustration of maternal inheritance dependent upon chromosomes. Single individuals isolated at an early stage by Boycott and Diver (*Proc. Roy. Soc. London B* 95: 207. 1923) produced (probably by self-fertilization) broods of 1 type only, dextral or sinistral, never mixed broods. Either type of parent produced either type of brood. The author suggests that the case is a simple Mendelian one with the dextral character dominant but the nature of a given individual determined by the unreduced egg of its mother. Crampton and Kofoed showed that dextral and sinistral snails are distinguishable at 2nd cleavage so this character would be expected to be determined very early.—*P. R. Sturtevant.*

2578. STURTEVANT, A. H. The probable occurrence of parthenogenesis in *Ochthiphila polystigma*. (Diptera). *Psyche* 30: 22-27. 1923.—Sixty-eight live *O. polystigma* were collected, all females. Fourteen were dissected; no sperm were found but many had fully formed eggs ready to lay. Pinned material was also examined but in 137 no males were found. Males are frequent in 4 other species of *Ochthiphila*. A similar case occurs in *Lonchoptera furcata*; 1,311 females were examined. Five males of *Lonchoptera* were found, but these all belonged to another species.—*P. R. Sturtevant.*

2579. STURTEVANT, A. H., AND T. H. MORGAN. Reverse mutation of the bar gene correlated with crossing-over. *Science* 57: 746-747. 1923.—The bar gene of *Drosophila melanogaster* reverts to its wild-type allelomorph with a frequency greater than that of any other known mutation in *Drosophila*. This mutation occurs only in the germ-cells of females. Of 6 reversions from controlled experiments, all were in gametes that carried chromosomes that had crossed over between forked and fused—loci on opposite sides of the bar locus and within 3 units of each other.—A. H. Sturtevant.

2580. TAYLOR, G. M. Degeneration of the potato. *Gard. Chron.* 73: 54. 1923.—The author comments on a paper by SERAPHIM MOTTET. *La degenerescence de la pomme de terre*. *Jour. Soc. Nat. Hort. France* 23: 263-268. 1922, which has been translated and published [see Bot. Absts. 12, Entry 4003].—C. H. Myers.

2581. TERASAWA, Y. Vererbungsversuche über eine mosaikfarbige Sippe von *Celosia cristata* L. [Genetic investigation of a mosaic-colored strain of *Celosia cristata*.] *Bot. Mag. Tokyo* 36: 75-83. 1922.—Red (*AA* or *Aa*) was found to be dominant to mosaic (*aa*). Heterozygous reds (*Aa*) produced reds and mosaics in an approximate 3:1 ratio. However, reds thought to be homozygous (*AA*), and mosaics, presumably *aa*, proved to be unstable, each producing about 3 per cent of the opposite class. The author believes that mutation of allelomorphs *A* to *a* and *a* to *A* at the rate of about 3 per cent is responsible for the phenomenon.—A. J. Mangelsdorf.

2582. TRABUT, L[OUIS]. Mutation par bourgeons chez les Citrus. La carpo Xenie et la clado Xenie. [Bud mutation in Citrus. Carpo Xenia and clado Xenia.] *Rev. Bot. Appl. et Agric. Coloniale* 3: 369-377. 3 fig. 1923.—The author briefly discusses "bud variation" in *Citrus*, especially with reference to the occurrence of navel fruits on trees of non-navel varieties and to variation in navel varieties. He cites Gallezio's claim to have produced "carpo Xenia" in an orange fruit by means of lemon pollen; this fruit had a lemon-like sector. He discusses other cases of bud variation in *Citrus*, and suggests that cross-pollination may be a frequent cause not only of carpo Xenia, where only the fruit is supposed to be affected, but of clado Xenia affecting buds on the supporting branch. From such buds, it is assumed, variant shoots may arise.—Howard B. Frost.

2583. VRIES, HUGO DE. Über die Mutabilität von *Oenothera Lamarckiana* mut. simplex. [On the mutability of *Oenothera Lamarckiana* mut. simplex.] *Zeitschr. Indukt. Abstamm.-u. Vererb.* 31: 313-351. 1 pl. 1923.—*Oenothera* mut. simplex arose from *O. Lamarckiana* mut. oblonga, behaving as a uniform race aside from numerous mutations. Also 3 constant forms, secunda, elongata, and compacta, have developed behaving genetically like simplex. Simplex lacks velutina gametes. Reciprocal crosses with various species and mutants show simplex to have the gamolytic formula (*simplex*¹ + *laeta*) ♀ × *laeta* ♂ while secunda is (*secunda*¹ + *laeta*) ♀ × *laeta* ♂. The *laeta* gametes are essentially the same as those of *Lamarckiana*, are isogamous, and possess the lethal factor. Simplex and secunda lack this factor, are heterogamous, and their gametes are not carried over to the pollen in a condition of viability at time of fertilization. When crosses are such that *laeta* gametes are expected to unite, empty seed result at a percentage corresponding fairly well with theory. In reciprocal crosses of *blandina*, containing only *velutina* gametes, with *simplex*, only *Lamarckiana* resulted in the F₁ while in the F₂ there appeared equal *Lamarckiana* and *blandina* zygotes. This indicates mutant *velutina* (*blandina*) lacks the lethal factor, thus differing from the *velutina* gamete of *Lamarckiana*.—In crossing *simplex* ♀ × *Lamarckiana* ♂ both ovules and pollen are heterogamous; the expected zygotes being (1) *simplex-laeta*, (2) *laeta-laeta*, (3) *simplex-velutina*, and (4) *laeta-velutina*. (2) should give only empty seed, (4) is *Lamarckiana*, (1) is a *laeta* corresponding to *lucida*, while (3) is a new form similar to *rubrinervis* (*deserens-velutina*). Crosses confirmed expectancy except *laeta* zygotes were too few. The reciprocal cross, *Lamarckiana* ♀ × *simplex*, yielded only *Lamarckiana*, as expected, as living zygotes.—Zygotes are "isogamous" if progeny of reciprocal crosses are alike, but this likeness can not be adhered to with extreme precision. The concepts of isogamy and heterogamy have definite pragmatic values in *Oenothera* investigations.—Mutants of *simplex* discussed in detail with results of crosses made between them and other forms are *fragilis*, *nanella*, *lata*, *scintillans*, *metallica*, *linearis*, *favilla*, *semigigas*, and *gigas*. It is evident from certain crosses that in *simplex* pollen about 6

per cent of "simplex" gametes may persist instead of all dying. It is further indicated that in *simplex* crosses the factor for brittleness (characterizing *fragilis* and other forms) acts isogamously and can be carried viably from ♀ to ♂ gametes or vice versa but this does not happen in *simplex* self-fertilized.—The mutant *semigigas* (chromosomes 21) arose not infrequently, especially after crossing, for in 1 instance 9 per cent of the progeny was *semigigas*, mainly the result of ovular mutations.—*Gigas*, with 28 chromosomes, arose only once from *simplex* and then through the medium of *semigigas* associated with other (sister) mutants. *Gigas* is strongly fertile and produced *gigas* offspring uniformly.—*L. R. Waldron*.

2584. WAGNER, K. *Experimentelle Untersuchungen über die Umwandlung des Geschlechts beim Frosch.* [Experimental investigations on the change of sex in the frog.] Arch. Entwicklungsmech. 52: 386-394. 1923.—Heretofore only transformation of females to males has been observed in the frog, and according to certain hypotheses the transformation of males to females would be impossible. The author apparently succeeded in changing males to females. It is not necessary to assume a complete destruction of the female-determining sex factors in the over-ripe frog egg from which males develop.—*John H. Schaffner*.

2585. WENHOLZ, H. *Practical methods of maize improvement.* Agric. Gaz. New South Wales 34: 717-721. 1923.—The difficulties of breeding maize either by the ear-to-row method or by the crossing of closely inbred strains, from the standpoint of the farmer, are pointed out. It has been found that in competitive contests consisting in the growing of 10-pound samples of the same variety submitted by different farmers, certain lots are decidedly higher yielding. Such high yielding samples have evidently been formed by the inclusion of a number of samples of somewhat different breeding.—*L. R. Waldron*.

2586. WILLIS, J. C. *The origin of species by large, rather than by gradual change, and by Guppy's method of differentiation.* Ann. Botany 37: 605-628. 1923.—Natural selection is essentially a theory of adaptation. The great bulk of the difference between species and genera is not adaptational and the author points out the inadequacy of the theory of natural selection of small variations to account for specific differences. The author refers approvingly to the conception of Guppy where one wide-ranging variable species is thought suddenly to throw off mutants that start a new species without necessitating the death of the parent species. Correlation being common, one would expect several characters to change at once, thus causing the mutants to be widely different. If wide-ranging species ultimately disappear the area is left divided up into smaller areas, each with its own species. The author's survey of Dilleniaceae showed that larger genera had 1 or 2 widely ranging species accompanied at spots by local endemics and supposedly the former shed the latter. On this supposition the whole pedigree of a family (descent and formation of genera) might be living at the present time. The author dwells on the idea that there has been much perplexity as to the formation of characters dividing one species, genus or family from another. Only experience can decide in any given case as to what are the most constant, widespread, and useful traits. Characters setting off one form from another usually have no conceivable use or value even in their mature stages. A character may be constant through a family or may occur sporadically, e.g., the position of the ovary, the presence or absence of the endosperm, its rumination or non-rumination.—*J. P. Kelly*.

2587. WITTE, H. *Några undersökningar öfver isoleringens inverkan på timotejens frösättning.* [The influence of isolation on seed production of timothy.] Sver. Utsädesför. Tidsskr. 32: 87-91. 1922.—The report contains the results of an experiment with different modes of pollination in timothy carried on through the summer of 1920. Glassine bags were used for all isolations. For 88 individuals the results are reported as follows: open pollination, 37.1 seed per 1 cm. head length; isolated, 3.3 seed per 1 cm. head length. Further investigation of the results showed that of 88 individuals 2 gave no seed at all due to ♀ sterility, and 16 set seed only when cross-fertilized, thus proving self-sterile. The remaining individuals could be classified as half fertile and several were fully fertile (under isolation).—For 8 individual plants, results were obtained for (1) open pollination, (2) isolation and self-fertilization, (3) isolation and cross-pollination with another individual. The results for these 3 methods were on the average for each cm. of head length respectively 42.0, 2.3, and 6.1 seed. The results show clearly that in timothy, as in rye, both sterile, self-sterile, half sterile (half-fertile), and self-fertile types are present.—*Aksel P. Lunden*.

2588. WITTE, WILLIAM H. **Bud variation in Coleus and divers cultivated plants. A contribution to evolution.** 32 p., 1 col. and 6 text pl. William H. Witte: Philadelphia, 1923.—Ten types of bud-sports are reported, all obtained directly or indirectly from the "Butterfly" Coleus and involving increase or decrease in red pigmentation. Other bud-sports are noted especially in certain green-and-white variegated plants, in the Boston fern, in roses, and in carnations. The author expresses the belief in a "law of mimicry" in plants and that bud variations are induced "by the simple expedient of placing plants of another color near them."—*A. B. Stout.*

2589. WOLFE, T. K. **Correlation between certain characters of the Green Mountain Irish potato.** Jour. Amer. Soc. Agron. 15: 467-470. 1923.—As a result of the study of 400 tubers and the study of the progenies of these tubers planted as tuber-units, the author finds apparently no relation between yield of marketable tubers and tuber characters. There is, however, a high positive correlation with the number of tubers produced and a significant negative correlation with the yield of non-marketable tubers. The number of eyes on a tuber increases with length, with volume, and with weight of tuber. There is apparently a close correlation between weight of tubers and length, circumference, width, and thickness of tubers.—*G. R. Bisby.*

2590. YULE, G. UDNY. **The laws of probability and their meaning.** Ann. Botany 37: 541-542. 1923.—Different fundamental assumptions lead to different types of frequency distribution. Non-agreement of an observed distribution with a given type of theoretical distribution shows that assumptions on which theoretical distribution is based do not apply in the particular case. Frequency of accidents in munitions factory accords best with distribution derived from assumption of different degrees of carelessness among workers; frequency of the size of genera fits a distribution derived from the Age and Area hypothesis.—*John Rice Miner.*

HORTICULTURE

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JOHN BUSHNELL, *Assistant Editor*

(See also in this issue Entries 2135, 2159, 2161, 2164, 2174, 2190, 2216, 2229, 2295, 2443, 2476, 2491, 2492, 2506, 2521, 2522, 2534, 2543, 2551, 2555, 2582, 2724, 2810, 3153, 3165, 3166, 3187, 3202)

FRUITS AND GENERAL HORTICULTURE

2591. ANONYMOUS. **Fertilizers in the orchard.** Australian practice and recommendations. South African Fruit Grower 9: 380-382. 1922.—The article deals with the fertilizer requirements of different fruit trees and the functions of lime. The fertilizers are chiefly those containing phosphoric acid, nitrogen, and potash.—*L. J. Goldblatt.*

2592. ALLEN, W. J. **Thompson's improved and navelencia oranges.** Agric. Gaz. New Wales 34: 712. 1923.

2593. AMSTEL, J. E. VAN. **Een en ander over de bereiding van de liberia koffie in Suriname.** [The treatment of liberia coffee in Surinam.] West Indië 8: 63-79. 1923.—Coffee growing in Surinam dates from 1720. During the early part of the 19th century arabica coffee decreased in production. About 1880 the Liberia coffee was introduced and is now generally found. Former processes of treatment of the Liberia coffee differ from the present methods. At present the berries arrive at the factory in the afternoon; after weighing they are placed in a receiving tank. The following morning the berries are crushed and placed in the fermentation basins provided with a drain. The mass soon starts fermenting, developing a temperature of 40-41°C. After 2-4 days the slimy mass loosens from the beans. When fermentation is finished, the coffee is washed, dried, peeled, and sorted. Every process mentioned is treated in detail.—*J. C. Th. Uphof.*

2594. ANCONA, E. P. **America's oldest apple orchard.** Amer. Forest. 29: 411-413. 6 fig. 1923.

2595. BAUM, F. Statistika moravského vinařství. r. 1921. [Vine statistics of Moravia in 1921.] Vinařský Obzor [Rev. de Viticulture] 17: 48-54, 60-64, 1923.—[Published for the Station des recherches viticoles à Brno.] Chemical analyses of the musts and wines from 30 species of Moravian grapes in 1921 are reported. The wines of that year contained slightly more alcohol than those of 1920 but there was a much greater reduction in the extract. The quality of the wines of 1920 was far better.—*Jos. Blaha.*

2596. ČECH, L. Novodobé pěstování révy vinné. [The new viticulture.] 43 p. Neubert: Praha. 1923.—The following important questions concerning the vine are considered; degeneration, causes of poor crops, conditions necessary for increasing crops, American vines, hybridization, and improvement of the vine. Theoretical conclusions based on observations of practice are given.—*Jos. Blaha.*

2597. CERIGHELLI, R. Le châtaignier dans ses rapports avec le sol. [Soil relationships of the chestnut.] Rev. Bot. Appl. et Agric. Coloniale 2: 259-264. 1922.—One of the important factors to be noted in studying the culture requirements of the chestnut is the condition of the soil. A microbiological study of the soil should be made in order to determine the precise effect of various fertilizers on the growth of the tree, and also the relation of the chemical composition of the soil to the mycorrhiza.—*Paul Russell.*

2598. CHEVALIER, AUG., ET [A.] ROBERTSON PROSCHOWSKY. Notes sur le bananier de Chine. [Notes on the Chinese banana.] Rev. Bot. Appl. et Agric. Coloniale 2: 285-287. 1922.—The Chinese banana (*Musa nana* Loureiro) is easily distinguished from the other bananas by its short, thick-set habit. It is produced in large quantities in the Canary Islands, whence it is shipped to Europe. These are the best bananas consumed in Europe, although in the tropics various varieties of *M. paradisiaca sapientum* excel them. The Chinese banana has been known commonly under the name of *M. Cavendishii* Lambert. The writers also mention and briefly discuss *M. coccinea* Andr., a species native to Indo-China and cultivated in southern China. It is scarcely edible, but is valued as a fiber plant. While the Chinese banana is not sufficiently cold-resistant to grow well in southern France, the Indo-China species (*M. coccinea*) has been observed to thrive in the colder parts of its native land, and therefore should be tried in the Mediterranean region.—*Paul Russell.*

2599. GERBAULT, M. Sur plusieurs fruitiers exotiques de la région de Lisbonne. [Exotic fruit trees in the vicinity of Lisbon.] Rev. Bot. Appl. et Agric. Coloniale 2: 58-60. 1922.—The coconut (*Cocos nucifera* L.) and the banana (*Musa paradisiaca sapientum* (L.) Ktze.) grow in Lisbon, but have not yet fruited. The date (*Phoenix dactylifera* L.) often fruits, but is not eaten, all of the good varieties being imported from the Sahara. The greater part of the citrus fruits (*Citrus* spp.) are raised in Portugal, as is also the pomegranate (*Punica granatum* L.). The loquat (*Eriobotrya japonica* Lindl.) is completely and abundantly naturalized. Only in the Botanic Garden are found the avocado (*Persea americana* Mill.), and several other tropical fruits. The passion fruits (*Passiflora* spp.) do not grow well in the vicinity of Lisbon. The kaki (*Diospyros kaki* L.) and several other species of the same genus do well and are sometimes cultivated.—*Paul Russell.*

2600. HEPPNER, MYER J. Rootstocks used by California nurserymen during 1922. Amer. Nurseryman 38⁵: 110. 1923.

2601. HODGSON, R. W. Analyzing the citrus orchard by means of simple tree records. California Agric. Exp. Sta. Circ. 266. 20 p. 1923.—Three sets of factors are operative in determining the production of citrus orchards: the cultural practices, the inherent qualities of the trees, and the orchard environment. The first 2 have received considerable attention but the 3rd has been largely neglected. It consists of an orchard efficiency analysis which emphasizes the tree as the ultimate production unit of the citrus orchard and includes the following steps: (1) establishing tree identities, (2) keeping simple estimate production records, (3) segregating the trees into classes according to yields, (4) determining the efficiency of the orchard, (5) determining the distribution of the trees in the orchard according to yields, (6) ascertaining the causes of consistent yield variation as to whether environmental or inherent in character, (7) analyzing the causes determined and applying proper remedial measures and (8) keeping a simple individual tree history record as an aid to increased tree efficiency.—*A. R. C. Haas.*

2602. JANSON, A. **Haselnusserträge.** [Hazelnut yields.] *Gartenwelt* 23: 19-20. 1919.—Records were made of 21 varieties of hazelnuts for 14 years, Wunder von Bollweiler, Landsberger, Englische Zellernuss, and Vollkugel being found the best. Hallesche Riesennuss produces large, thin-walled nuts.—*J. C. Th. Uphof.*

2603. KANNAPPEL, ALBERT. **Quercus Robur mit süsser Eichel.** [Quercus Robur with sweet acorns.] *Möllers Deutsch. Gärtnerzeitg.* 38: 255-256. 1923.—This form, the acorns of which keep their sweet flavor for some time, may become of economic importance.—*J. C. Th. Uphof.*

2604. MATULIONIS, P. **Kaip ir Kuomet Medžius Leisti (Kirsti).** [How and when to prune trees.] *Želmenija* 2: 96. 1922.

2605. PESCOTT, ED. E. **Bees, principal pollinators.** *South African Fruit Grower* 9: 379. 1922.—When cross-pollination occurs, especially between different varieties, better fruit results. Bees play the most important part in the carriage of pollen.—*L. J. Goldblatt.*

2606. RUTGERS, A. A. L. **Investigations on oil palms.** *Exp. Sta. A. V. R. O. S. Medan, Nederland.-Indië* 125 p., 19 pl., 4 fig. 1922.—This gives the results of investigations in Sumatra. The subject is treated by 6 authors in 11 chapters under the titles indicated below. An extensive bibliography and 9 pages of appendices dealing with acreage, yields, and prices conclude the bulletin. (1) A. A. L. RUTGERS. The history of the oil palm in Netherlands India. The history of the oil palm plantation industry in Sumatra begins in 1910. By 1922, 28,000 acres had been planted on the east coast of Sumatra mostly from seed of trees introduced in 1848. (2) C. YAMPOLSKY. Varieties of the oil palm (*Elaeis guineensis* Jacq.). No final classification can be made until breeding experiments have determined which forms are hybrids. The oil palm is a cross-pollinated plant which can be propagated from seed only. A classification based largely upon the thickness of the shell of the fruit is given. The following are the 4 most important varieties in Sumatra: (a) *Elaeis guineensis* var. *macrocarpa* ("Congo type," imported from Congo), thick shelled, 4-8.5 mm. (b) *E.g.* var. *dura* ("Deli type," the bulk of the oil palms of Sumatra), shell 2-5 mm. (c) *E.g.* var. *tenera* ("Lisombe type"), shell 1-2.5 mm. (d) *E.g.* var. *pisifera* ("pisifera type"), without shell; kernel[♂] small; perhaps an abnormality. *Elaeis Poissoni* Annet, without mature trees in Sumatra, has a form with a rich oil content and is destined to play an important rôle in future plantings in Sumatra.—(3) J. G. J. A. MAAS. Planting of oil palms. Since oil palms differ in their ability to produce oil, great care must be exercised in selecting seed. Good ripe seed germinates more quickly than somewhat unripe or overripe seed. Oil palm seed germinate slowly. Removing the husk hastens germination, as also heating the husked seed at 40°C. for about 2 weeks, whereby 60-80 per cent germination can be obtained within 3 months. The viability of seed can be preserved for over 2 months packed in a moist mixture of equal parts of charcoal and sand. Various seed-bed and nursery-bed practices, and various planting systems, are discussed in detail.—(4) J. G. J. A. MAAS. The upkeep of an oil palm plantation. Under soil management the author discusses catch-crops, cover crops, green manuring, cultivation, weeding and methods to prevent erosion. The care of trees consists in removing and burning the old leaves. Total fruit production of heavily pruned trees decreases very quickly when compared with normally pruned trees.—(5) G. HEUSSER. Artificial pollination in the oil palm *Elaeis guineensis* Jacq. The oil palm is closely related to the coconut palm. The flowers are unisexual and mixed inflorescences are abnormal. Experiments in artificial pollination increased the yield 158%. It was possible to get 50% germination from pollen stored 9 weeks in a closed flask containing unslaked lime. The morphology of the flower is discussed and a colored plate shows the exact stages when pollination can take place.—(6) J. G. J. A. MAAS. Estimating the age of oil palms. Growth in height varies with the amount of shading and other factors, and the number of leaves produced per year, 20-24 on the east coast of Sumatra, seems to be the best indicator of age. Methods are suggested for estimating the age of oil palm trees.—(7) A. A. L. RUTGERS. Diseases and pests of the oil palms. Little is known about diseases and pests of the oil palm but several have been reported in western Africa. The most important disease in Sumatra is the crown-disease (cause unknown) attacking young leaves. The pests which have been found on oil palms in Sumatra; are listed.—(8) J. F. C. VAN HEURN. The preparation of palm oil. The main processes are

heating, depulping and pressing. The methods employed are those that insure an oil with a low fatty acid content. Heating the fruits before bruising inactivates the enzymes, which otherwise rapidly split the fat into fatty acids and glycerine especially in injured or freshly crushed pulp. Various methods of heating are described. The first pressing is made under low pressure (below 100 atmospheres) and yields only oil mixed with a considerable amount of water but otherwise pure. The fruits are then dried in the sun, depulped, heated with steam, and again pressed under high pressure (about 425 atmospheres, in order to remove the remaining 20% of oil. The dried pits are cracked and the kernels are separated and pressed.—(9) H. N. BLOMMENDAAL. Threshing machines for oil palm fruits. A method is described whereby the entire fruit bunch is first heated in hot water this being followed by mechanical loosening with a threshing machine. If the fruits are threshed without first heating the bruising results in the formation of fatty acids in such large quantities that the fats obtained are unsuitable for edible oil.—(10) A. A. L. RUTGERS. Packing, shipping, and selling of palm oil.—(11) A. A. L. RUTGERS Crop records of oil palms. The actual output of an acre of oil palm trees 10–30 years old is about 1500 pounds of oil and 500 pounds of kernel per year.—W. C. Muenscher.

2607. RYERSON, KNOWLES. *Avocado culture in California. Part 1. History, culture, varieties, and marketing.* California Agric. Exp. Sta. Bull. 365. 575–629. 1923.

2608. SAX, KARL, AND JOHN W. GOWEN. *The cause and permanence of size differences in apple trees.* Maine Agric. Exp. Sta. Bull. 310. 8 p., 2 fig. 1923.—Under similar conditions, apple trees show early and permanent differences in size. These differences apparently depend upon variability of the seedling stocks and are correlated with similar differences in productivity. The larger 1-year whips are recommended.—Donald Folsom.

2609. SCHMEISS, OSCAR. *Ertragreiche Kirschenspalier.* [Productive cherry espaliers.] Möllers Deutsch. Gärtnerzeitg. 34: 209–210. 1 fig. 1919.—A Swiss local variety, *Schöne Klittgauerin*, proved productive as an espalier against walls.—J. C. Th. Uphof.

2610. SMITH, C. W. *Fighting spring frosts.* South African Fruit Grower 9: 289–290. 1 fig. 1922.—The author discusses the cause and effect of frosts; also preventive methods.—L. J. Goldblatt.

2611. WINKLER, FR. *Der Gartenbau in Russland unter dem Kaiserreich.* [Horticulture in Russia during the empire.] Gartenwelt 23: 89–91. 1919.—There is a general discussion of the development of horticulture, nurseries and horticultural societies, and of their encouragement by the various czars and grand dukes.—J. C. Th. Uphof.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

2612. ANONYMOUS. *Kambariy gēlēs.* [House plants.] Želmenija 2: 94–96. 1922.

2613. CALVINO, MARIO. *Un nuevo árbol frutal y de ornato para Cuba.* [A new fruit-bearing ornamental tree for Cuba.] Rev. Agric. Com. y Trab. [Cuba] 52: 9–11. 2 pl. 1922.—This species, *Pileus heptaphyllus* Ramirez, a native of Yucatan, was formerly known as *Jacaratia mexicana* A. DC. and is closely allied to species of the genera *Vasconcella*, *Carica*, and *Mocinna*. The tree is deciduous and dioecious, and in growth characters resembles *Carica Papaya* L. and *Ceiba pentandra* Gaertn. The leaves are lost in the winter and the tree flowers and fruits without leaves, the edible fruit maturing in the spring (May and June). Apparently the tree is well adapted to culture in Cuba.—G. R. Hoerner.

2614. GEIER, M. *Pflanzenschmuck an Häusern in Gebirge.* [Plant decoration on mountain houses.] Gartenwelt 23: 17–19. 1 fig. 1919.

2615. GROVE, A. *Lilies.* [Rev. of: SMITH, W. WRIGHT. Notes on Chinese lilies. Trans. and Proc. Bot. Soc. Edinburgh 28: 122–160. Pl. 4–7. 1922.] Gard. Chron. 73: 274–276. Pl. 128–129. 1923.—In the reviewer's opinion this is an exhaustive and important taxonomic contribution and "will be welcomed by those interested in the genus, as throwing light on points which have long needed illumination."—P. L. Ricker.

2616. KACHE, P. *Die Zierkirsche Prunus serrulata ochichime.* [The ornamental cherry *Prunus serrulata ochichime*.] Möllers Deutsch. Gärtnerzeitg. 34: 2. 1919.—This form compares favorably with *P. hisakura*. It has a healthy growth, flowers profusely, and is one of the best ornamental flowering cherry trees.—J. C. Th. Uphof.

2617. KARRER, S. *Vicia hybrida* "Schneewehe." Möllers Deutsch. Gärtnerzeitg. 34: 249. 1 fig. 1919.—This 1919 novelty, produced from *Vicia Gerardii*, has abundant white flowers.—*J. C. Th. Uphof.*

2618. KOPKE, AUGUST. Zur Kultur der Poinsettien. [Poinsettia growing.] Möllers Deutsch. Gärtnerzeitg. 38: 249-250. 3 fig. 1923.—Poinsettias are propagated from hardwood and from softwood cuttings, the latter being made until the middle of July. The treatment of cuttings, soil mixtures, and pruning are presented.—*J. C. Th. Uphof.*

2619. LÖBNER, MAX. Neue Treib-Astilbe-Sorten. [New Astilbe varieties for forcing.] Möllers Deutsch. Gärtnerzeitg. 34: 1-2. 1919.—The varieties Queen Alexandra, Amerika, and Peach Blossom, which were forced, flowered after 12, 13, and 14 weeks, respectively. The methods of forcing Astilbe are described.—*J. C. Th. Uphof.*

2620. OELRICH, E. Neuere Nephrolepis. [New Nephrolepis.] Möllers Deutsch. Gärtnerzeitg. 34: 50-51. 1919.—*Nephrolepis Neubertii* is a very fine leaved form and is more dwarfed than *N. Whitmani*. One-year-old plants are best commercially. *N. Wredei*, originated from *N. Whitmani* is a rapid grower. It originated with E. Neubert in Wandsbeck.—*J. C. Th. Uphof.*

2621. PFITZER, W. Anemone japonica "Schneekönigin" (Neuheit 1924). [Anemone japonica "Schneekönigin," 1924 novelty.] Möllers Deutsch. Gärtnerzeitg. 38: 234. 1923.—This new variety has snow white flowers, is earlier than Luise Uhmk, and its petals are broader. The originator was W. Pfitzer in Stuttgart.—*J. C. Th. Uphof.*

2622. RUDOLPH, OSWALD. Ein empfehlenswerter Maiblumentreibverfahren. [A recommended procedure for forcing lilies of the valley.] Gartenwelt 23: 31-32. 1919.—Rhizomes of *Convallaria majalis* were treated with hot water. The plants flowered in 18 days under a temperature of 30°C.—*J. C. Th. Uphof.*

2623. RUDOLPH, OSWALD. Poinsettia Rudolphs Imperator. Gartenwelt 23: 137-138. 1 fig. 1919.—This sport of *P. Treibstii*, has salmon-red bracts, flowers earlier than the latter, and needs less heat.—*J. C. Th. Uphof.*

2624. SCHICK. Ueberwinterung von Palmen im Freien. [The wintering of palms outdoors.] Gartenwelt 23: 1-2. 2 fig. 1919.—*Trachycarpus excelsa* can withstand a temperature of -21.2°C. when covered with leaves and straw. *Sabal palmetto* also withstands considerable cold.—*J. C. Th. Uphof.*

2625. SILVA TAROUCA, ERNST, UND CAMILLO SCHNEIDER. Kulturhandbücher für Gartenfreunde. [Cultural hand-books for lovers of plants.] 3 vol. 8 vo. Hoelder-Pichler-Tempsky: Vienna; G. Freytag: Leipzig, 1922-1923. Vol. 1. Unsere Freiland-Stauden. [Our hardy perennials.] 3rd ed., 315 p., 16 pl., 451 fig. 1922. Vol. 2. Unsere Freiland-Laubgehölze. [Our hardy broad-leaved trees and shrubs.] 2nd. ed., 464 p., 16 pl., 499 fig. 1923. Vol. 3. Unsere Freiland-Nadelhölzer. [Our hardy conifers.] 2nd. ed., 418 p., 18 pl., 318 fig. 1923.—The aim of the authors has been to give in a concise and practical manner information on the various kinds of herbaceous perennials, shrubs, and trees known to be in cultivation and hardy in middle Europe, chiefly as regards their cultivation and ornamental merits. The main part of each volume consists of an alphabetical enumeration of genera with their various species and more important garden forms, each briefly characterized and with notes on cultivation, propagation, and ornamental uses. This enumeration is preceded by a series of general articles written by different authors mostly specialists in their lines dealing with the kinds adapted for general planting, for planting in parks, in the formal garden, and in the rock-garden, for forcing, for cut flowers, for hedges, for street planting, for forest planting, etc. There are also general articles on the propagation and cultivation of perennials, of trees and shrubs, of conifers, on the pruning of trees and shrubs, and on the conifers of North America and those of China. Following the alphabetical enumeration of genera numerous and various lists are given, such as kinds with ornamental fruit, with conspicuous foliage, with fragrant flowers, with showy autumnal foliage, trees and shrubs conspicuous in winter, lists of plants arranged according to their soil requirements, according to their flowering season, to the color of their flowers, to their habit, to the size the different trees and shrubs attain, and to their rates of growth, etc. The numerous illustrations, (more than 1,260 in the text and 60 colored figures on 40 plates in the 3 volumes), are reproductions of photo-

graphs illustrating almost exclusively the habit of perennials, shrubs, and trees, some taken in gardens of Europe and America, some in their natural habitats in Europe, North America, and Asia. The volume on conifers contains also drawings illustrating botanical details to aid in the determination of species. The colored plates are reproductions of color photographs.—*Alfred Rehder.*

2626. SOFFERT, F. **Mehr Maiblumenanbau.** [Increased culture of lilies-of-the-valley.] Möllers Deutsch. Gärtnerzeitg. 38: 228-230, 237-238. 1 fig. 1923.—The following factors are important: proper soils, cheap labor, abundance of fertilizer, and a thorough cultural knowledge. Light loamy soils are best. The sorting, packing, and transportation of the rhizomes are discussed.—*J. C. Th. Uphof.*

2627. TEUPEL, KARL. **Neue grossblumige gefülltblühende Zonal-Pelargonie "Höfgärtner Nietner."** [New, large, double-flowered Zonal Pelargonium "Höfgärtner Nietner."] Möllers Deutsch. Gärtnerzeitg. 34: 281. 1 fig. 1919.—This carmine red variety has a strong, robust growth and is suitable for potting as well as for beds. The originator was Gebr. Teupel of Quedlinburg.—*J. C. Th. Uphof.*

2628. VERHALEN, GEO. F. **Rose varieties for southern nursery trade.** Amer. Nurseryman 38⁶: 108-109. 1923.

2629. WEGENER, H. **Obconica-Primeln für den Blumenschnitt.** [Obconica Primulas for cut flowers.] Möllers. Deutsch. Gärtnerzeitg. 38: 209-210. 1 fig. 1923.—Apfelblüte, Salmonea, and Karmesina rosea of the *Primula obconica grandiflora* group and coerulea and lilicea of the *gigantea* group are recommended for bouquets.—*J. C. Th. Uphof.*

VEGETABLE CULTURE

2630. BLAU, E. **Gurken, Treibgemüse, und Schnittblumen in Gewächshäuser ohne Heizung.** [Cucumbers, vegetables, and cut flowers in greenhouses without heating.] Möllers Deutsch. Gärtnerzeitg. 38: 241-243. 1923.

2631. CHEVALIER, AUG. **Multiplication des pommes des terre à l'aide de fragments.** [Potato propagation by means of sections.]. Rev. Bot. Appl. et Agric. Coloniale 2: 289-291. 1922.—This is a discussion of the relative merits of 3 methods of propagating the potato, (1) planting the tuber entire, (2) planting sections of different sizes, and (3) planting parings.—*Paul Russell.*

2632. LOHFELD. **Spinatanbau nach Sorten und Jahreszeit.** [Spinach raising according to variety and season.] Möllers Deutsch. Gärtnerzeitg. 38: 205-206. 1923.—Savoyer Gelbe and Bloomsdale spinach are recommended for early fall; Flämischen Riesen, Catilow, Korbfüller, Imperator, Frankfurter, Braunsweiger, Gaudry, and Viroglag for autumn and early winter. Hardier sorts are Amsterdamer Riesen, Eskimo, and Langblättrige Winter. The following kinds make a slow growth in the fall but are especially vigorous in the spring: Soissons, Goliath, Victoria, Weseler, Ideal, and Triumph.—*J. C. Th. Uphof.*

2633. SMITH, CHARLES W. **Onion production.** The kinds to grow and the way to grow them. South African Fruit Grower 10: 53. 1923.—While onions are grown extensively in South Africa, more could be grown profitably. They are an excellent crop for the smallholder.—*L. J. Goldblatt.*

2634. THOMPSON, H. H. **Sweet-potato planting problems.** Agric. Jour. [British Columbia] 8: 52, 61. 1923.

HORTICULTURAL PRODUCTS

2635. ANONYMOUS. **Experiments in the bleaching of walnuts.** Agric. Gaz. New South Wales 34: 748. 1923.—Walnuts dipped in bleaching solution and not sulphured gave best results. The formula for the solution is given.—*L. R. Waldron.*

2636. SCHMITT, RICHARD. **Die 1921-er Traubenmoste Frankens.** [Musts of 1921 in Franconia.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 44: 216-217. 1922.

2637. STERN, J. **Moste des Jahres 1921 aus dem Weinbaugebieten der Nahe, des Glans, des Rheintales unterhalb des Rheingaus, des Rheingaus, der Lahn, des Rheines und Maines.** [Musts of 1921 in the vineyard regions of Nahe, Glans, Rheintal below Rheingau, Rheingau, Lahn, Rhine, and Mayence.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 44: 47. 1922.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 2339, 2346, 2506, 2809, 2816, 2839, 3157, 3173)

2638. DEBBARMAN, P. M. A peculiar bulb of *Allium sativum* Linn. Jour. Indian Bot. Soc. 3: 296-297. 1 pl. 1923.—A bulb consisting of a few bulblets in the top of a larger bulb, also composed of several bulblets, is interpreted as a primary bulb with an abortive scape bearing bulblets instead of flowers.—*Winfield Dudgeon*.

2639. DIEDRICHS, A., und B. SCHMITTMANN. Der Samen von *Afzelia africana*. [The seed of *Afzelia africana*.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 44: 215-216. 1922.—The seed of this African papilionaceous tree is described, with measurements and weights, and proximate analyses.—*E. E. Stanford*.

2640. DUTHIE, A. V. Studies in the morphology of *Selaginella pumila* Spring, part 1. The vegetative organs of the sporophyte. Trans. Roy. Soc. South Africa 10: 201-211. Fig. 1-26. 1922.—Specimens gathered in shaded situations on hill slopes are delicate and often procumbent with ovate leaves; those on exposed flats are wiry and erect with lanceolate leaves. Plants vary greatly in size. The external morphology of the plants is considered in detail and an account is given of the internal morphology of root, stem, and leaf.—*E. M. Doidge*.

2641. DUTHIE, A. V. Studies in the morphology of *Selaginella pumila* Spring, part 2. The cones, spores and gametophytes. Trans. Roy. Soc. South Africa 11: 131-144. Fig. 1-20. 1923.—Young cones begin to form early in August and 4 megaspores may be recognized in the basal sporangia of some of the cones. Shedding of ripened spores takes place during October and November. The anatomy of the cones is described and illustrated and a detailed account is given of the development of the spores and of the gametophyte.—*E. M. Doidge*.

2642. GREGER, JUSTIN. Beiträge zur Kenntnis der Samen und Früchte von Ackerunkräutern. [Contributions to knowledge of seeds and fruits of field weeds.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 44: 70-80. 2 pl. 1922.—An illustrated anatomical study of the fruits and seeds of *Fumaria officinalis* L., *Galium aparine* L., *G. verum* L., *G. boreale* L., *G. asperum* Schreb., and *G. mollugo* L. is reported.—*E. E. Stanford*.

2643. MELL, C. D. Unusual coconut trees. Amer. Forest. 29: 410. 1 fig. 1923.—This note concerns 3 distinct coconut trees which have developed from a single coconut.—*Chas. H. Otis*.

2644. SAHNI, B. On the theoretical significance of certain so-called "abnormalities" in the sporangiophores of the Psilotaceae. Jour. Indian Bot. Soc. 3: 185-191. 3 fig. 1923.—The author suggests that the fertile organs of the Psilotaceae are built on a primary verticillate plan, the sporangiophore of *Psilotum* being primitively a shoot bearing a whorl of 3 (now reduced to 2) sterile lobes, succeeded by a whorl of 3 sporangia (trilocular synangium) alternating in position with the sterile lobes; and that of *Tmesipteris* being originally an axis bearing a whorl of 2 sterile lobes, followed by a pair of sporangia (bilocular synangium) placed decussately to the sterile lobes. The normal sporangiophore of *Tmesipteris* differs from the hypothetical chiefly in the presence of an adaxial bend in the short synangial stalk, but this bend is produced during the development, the axis of the young sporangiophore being straight in both *Psilotum* and *Tmesipteris*. The normal sporangiophore of *Psilotum* differs from the hypothetical chiefly in the absence of the 3rd (inner) sterile lobe, which, if present, would lie between the synangium and the main stem. The atrophy of this lobe may have been dictated by the contingencies of space.—If the conjecture put forward is justified, the sporangiophores of the Psilotaceae, while agreeing in their verticillate organization with those of the Equisetales and some Sphenophyllales, would be unique among vascular cryptogams in the possession of whorls of sterile lobes alternating with the fertile whorls. The comparison with forked sporophylls would thus become more unreal than ever, while the affinity of the Psilotaceae with the Sphenophyllales can at best be only a distant one.—*B. Sahni*.

2645. STURZ, WILHELM. Sonderbares Schicksal einer Palme. [Strange history of a palm.] Gartenwelt 23: 2. 1919.—On the island of Catharina, Brazil, a plant of *Cocos Roman-*

zoffiana was broken off by a storm but soon started to produce a new sprout from the broken stem, a phenomenon heretofore unknown among palms.—J. C. Th. Uphof.

2646. ZÖRNITZ, H. *Sonderbare Baumformen im Walde*. [Strange tree-forms in the forest.] *Gartenwelt* 23: 161-162. 8 fig. 1919.—Descriptions and photographs are presented of oaks which were grown together; of birch and oak with considerable outgrowths on the stem; of roots of an old beech grown together; and of some malformations on some old plants of *Tilia*.—J. C. Th. Uphof.

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 2246, 2255, 2343, 2370, 2714, 2989, 3005)

2647. Мейер, К. И. [MEYER, K. I.] *Фитопланктон реки Оки под Муромом*. [Phytoplankton of the Oka River at Muron.] *Работы Окской Виологической Станции* [Contrib. Oka Biol. Sta.] 2: 13-81. 1923.—In this study of the seasonal changes in the phytoplankton at Oka observations are recorded on 108 species of which 50 are Chlorophyceae, 20 Cyanophyceae, 27 Diatomaceae and 9 Flagellatae. In winter the plankton is characterized by a few species of diatoms, especially of *Melosira*, *Nitzschia*, *Fragillaria*, and *Snyedra*. During May and early June the number of species and individuals increases rapidly, those of *Asterionella* and *Dynobryon* becoming dominant. By the end of July the bluegreens become most abundant. From August to November the plankton decreases and is again dominated by diatoms. *Asterionella* reaches a 2nd maximum in November.—L. H. Tiffany.

2648. Миллер, В. В. [MILLER, V. V.] *Альгологические наблюдения. I. II.* [Algological observations I. II.] *Известия Иванова-Вознесенского Политехнического Института* [Memoirs Ivanov-Voznesensk Polytechnic Institute] 4: 47-65. 2 pl. 1921.—I. *Emergococcus lucens* n. gen. and sp. (Volvocales—Chlamydomonadaceae) and *Emergosphaera superficialis* (n. gen. and sp. (Protococcales—Eniosphaeraceae) are characterized.—II. A description of *Menzbierella paragraphon* n. gen. and sp. (Protococcales—Scenedesmaceae) is given. All 3 algae occur in the vicinity of Ivanov-Voznesensk, Moscow. The more remarkable features are the exposed habitat of *Emergococcus* and *Emergosphaera* and the curious colony form of *Menzbierella*.—B. Kozot-Poljanski.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 2227, 2228, 2232, 2235, 2255)

2649. BELTRÁN, F. *Una hepática nueva para la Peninsula Ibérica*. [A new hepatic for the Iberian Peninsula.] *Bol. R. Soc. Espan. Hist. Nat.* 20: 310-312. 1920.—The author announces the discovery of the floating form of *Ricciocarpus natans* (L.) Corda in the vicinity of Valencia, Spain. Although this species is almost cosmopolitan in its distribution it has not before been reported from the Iberian Peninsula. The suggestion is made that its strong superficial resemblance to *Lemna minor* is the cause of its having been overlooked.—A. W. Evans.

2650. BINSTED, C. H. *The mosses of the English Lake District*. *Vasculum* 8: 65-83. 1922.—After reviewing briefly the history of bryology in the English Lake District, the author enumerates the mosses so far recorded from the region, following the classification and nomenclature of Dixon's Handbook, 2nd edition. Except in the case of the commonest species full data are given regarding localities. The list includes 95 genera, 362 species, and 81 varieties. The following genera are represented by 10 species or more apiece: *Barbula* (12), *Brachythecium* (10), *Bryum* (22), *Dicranum* (10), *Eurhynchium* (12), *Fissidens* (10), *Grimmia* (18), *Hypnum* (34), *Mnium* (10), *Orthotrichum* (12), *Polytrichum* (10), *Tortula* (11), and *Webera* (10).—A. W. Evans.

2651. BROTHERUS, V. F. *Musci novi sinenses, collecti a D^{re} Henr. Handel-Mazzetti, I.* [New Chinese mosses collected by Dr. Handel-Mazzetti, I.] Sitzungsber. Akad. Wiss. Wien, (Math.-Nat. Kl.) Abt. I. 131: 209-220. 1922 [1923].—The present paper is one of a series in which the results of Handel-Mazzetti's expedition to China during the years 1914-1918 are reported upon. The new mosses here proposed, with Latin diagnoses, were collected in the provinces of Hu-nan, Sze-Chuan and Yun-nan and are as follows: *Braunia obtusiuspes*, *Brachysteleum evandinerve*, *Brachymenium muricola*, *Brotherella Handelii*, *B. piliformis*, *Bryum setschwanicum*, *Catharinaea yunnanensis*, *Dicranum perfalcatum*, *Distichophyllum stillicidiorum*, *Duthiella rigida*, *Entodon cochleatus*, *E. obtusatus*, *Pauriella tenerrima*, *Gollania horrida*, *Homaliodendron papillosum*, *Homalothecium perimbricatum*, *Hyophila aristulata*, *Leptodontium setschwanicum*, *Macromitrium Handelii*, *M. quercicola*, *Macrothamnium setschwanicum*, *Meiothecium angustirete*, *Mnium luteolimbatum*, *Molendoa yunnanensis*, *Neckera decurrens* (with the new var. *rupicola*), *N. setschwanica*, *Penzigiella* (?) *robusta*, *Pohlia subflexuosa*, *Sciariomium sinense*, *Thamnum laerinerve*, *Timmia leptocarpa*, *Trachypus racomitrioides*, *Trichostomum involutum*, and *T. obtusifolium*.—F. Weiss.

2652. BUCH, H. *Die Scapanien Nordeuropas und Sibiriens.* [The Scapania of northern Europe and Siberia.] Comment. Biol. Soc. Sci. Fenn. 1*: 1-21. 11 fig. 1922.—The present paper is the 1st instalment of the author's monographic treatment of the genus *Scapania*, as represented in northern Europe and Siberia. It includes an introduction, a description of the material and methods of study employed, and a discussion of the organography of the genus from the standpoint of taxonomy. Emphasis is laid on the importance of characters derived from living cells and on data secured by subjecting the various species to rigid cultural conditions, in which the degree of illumination and the amount of transpiration are more or less definitely controlled. In distinguishing the species of *Scapania* the stem-segments, the leaves, the gemmiparous organs, and the cells afford the most trustworthy characters, the structure of the walls and the contents of both leaf-cells and spores being especially utilized.—A. W. Evans.

2653. CAMPBELL, DOUGLAS HOUGHTON. A remarkable development of the sporophyte in *Anthoceros*. *Science* 58: 307-308. 1923.—Specimens of *Anthoceros fusiformis* Aust., collected in California, showed an abnormal growth of the sporophytes, which seemed to have attained almost complete independence of the gametophyte. The longest were 6 inches in length, much thicker than usual, and with the spore formation nearly suppressed in the basal region.—C. J. Lyon.

2654. DISMIER, G. *Florule bryologique de Saint-Péray (Ardèche).* [Moss flora of Saint-Péray (Ardèche).] Rev. Bryologique 48: 72-75. 1921.—The present report is based on a series of excursions made by the author in the vicinity of Saint-Péray, department of Ardèche, France. Since the region studied is situated in the valley of the Rhone the flora has certain southern elements, *Camptothecium aureum* and *Epipterygium Tozeri* being given as examples. The species found are arranged in lists according to the localities visited and include 122 mosses and 33 hepatics.—A. W. Evans.

2655. DIXON, H. N. *Miscellanea bryologica.*—VIII. Jour. Botany 60: 281-291. 1922.—The 2 preceding numbers of this series have already been abstracted [see Bot. Absts. 3, Entry 701; 10, Entry 1837]. In the present number the nomenclatorial status of the genus *Microthamnium* Mitt., dating from 1869, is first considered, and the conclusion is reached that its validity is not affected by the existence of the algal genus *Microthamnion* Naegeli, dating from 1849. The synonymy of *Didymodon recurvus* (Mitt.) Broth. of the Himalayas is then discussed, and the distinctness of the species from *Gymnostomum recurvum* Griffith, with which it has been confused, is clearly established. The proper dates of the 7 parts of Duby's *Choix de Cryptogames*, etc., which have been incorrectly cited in the literature, are then given. The remainder of the paper is taken up with critical or distributional notes on 6 species of mosses, most of which are tropical. The 1st of these, *Fissidens Zippelianus* Dozy & Molke of the Indo-Malayan region and Africa, is reduced to synonymy under *F. silvaticus* Griffith; the 2nd, *Orthotrichum leptocarpum* of Abyssinia, as represented at the Kew Herbarium, is shown to consist of 2 distinct species, the true *O. leptocarpum* C. M. and *O. firmum* Vent.; the 3rd, *Brachythecium decurvans* (Mitt.) Jaeg. of the Himalayas, is referred to the genus *Bryhnia* and becomes

Bryhnia decurrens (Mitt.) Dixon n. comb.; the 4th, *Syrropodon rufescens* Hook. & Grev., is reported from Borneo and proved to be distinct from *S. bornensis* (Hampe) Jaeg.; the 5th, *Thysanomitrium Richardii* Schwaegr., is shown to have many synonyms and to have a wide distribution in America, Asia, and the Pacific Islands; while the 6th, *Cyrtopus setosus* (Hedw.) Hook. f., is proved to have a more limited distribution than had been supposed, being restricted apparently to New Zealand and Tasmania.—A. W. Evans.

2656. DIXON, H. N. The mosses of the Wollaston Expedition to Dutch New Guinea, 1910-13; with some additional mosses from British New Guinea. Jour. Linn. Soc. Bot. 45: 477-510. Pl. 28-29. 1922.—The mosses of the Wollaston Expedition include 33 species and are listed with full data regarding localities. In many cases critical remarks are added, and a key to the 8 species of *Dawsonia*, now known from New Guinea, is given. The new species proposed are as follows: *Breutelia longicapsularis*, *Bryum papuanum*, *Chaetomitrium laevisetum*, *C. perlæve*, *Dawsonia crispifolia*, *D. limbata*, *Ectropothecium aureum*, *E. dentigerum*, *E. laxirete*, *Hymenodontopsis rhizogonioides*, *Hypnodendron parvum*, *Pogonatum Klossii*, *Thuidium scabribRACTEATUM*, and *Trichosteleum capillarisetum*. There are also 3 new combinations, as follows: *Plagiothecopsis oblonga* (Broth.), based on *Ectropothecium oblongum* Broth.; *Sematophyllum leptocarpon* var. *cylindricum* (Reinw. & Hornsch.), based on *Hypnum cylindricum* Reinw. & Hornsch.; and *Thysanomitrium Blumei* (Dozy & Molk.), based on *Trichostomum Blumei* Dozy & Molk. The mosses from British New Guinea were collected in 1916 by J. B. Clark on Mt. Durigolo in the Port Moresby District. These include 50 species, of which the following 9 are proposed as new: *Acanthocladium Clarkii*, *Campylopus subcomosus*, *Leucobryum cyathifolium*, *Pterobryella papuensis*, ? *Rhizogonium orbiculare*, *Sematophyllum roseum*, *Syrropodon durigolensis*, *Trichosteleum grosso-mamillosum* (C. M.) Par. (*Thelidium grosso-mamillosum* C. M. ms.), and *T. sematophylloides*. In addition a new var. *speirostichum* (C. M.), based on *Leucobryum speirostichum* C. M. ms., is described under *L. candidum*. On the accompanying plates 18 of the new species are illustrated.—A. W. Evans.

2657. EVANS, ALEXANDER W. Abruzzi Hepaticae. Rev. Bryologique 47: 57-58. 1920.—The author enumerates, with data regarding localities, 14 species of Hepaticae which he collected in the Abruzzi Mountains of central Italy during July, 1914. These species include 2 representatives of the Marchantiales and 12 of the Jungermanniales, several of the species being characteristic of limestone regions.—A. W. Evans.

2658. FLORIN, RUDOLPH. Zytologische Bryophytenstudien II und III. [Cytological studies on bryophytes II and III.] Ark. Bot. 18: 1-58. Pl. 1, 25 fig. 1922.—The 1st of these studies has been abstracted [see Bot. Absts. 2, Entry 1279]. In the 2nd study the development of the archegonium of *Riccardia pinguis* is described. In its normal development no stalk-cell is formed, and the number of neck-canal cells is small, the archegonium agreeing in these respects with those of *Riccia*, *Marchantia*, and certain other genera of the Hepaticae. In contradistinction to *Riccia* and *Marchantia*, however, there is no clear demarcation between the venter and the neck of the archegonium. Several abnormalities are reported. Thus, a young archegonium was found in which 4 morphologically equal nuclei had arisen from the original nucleus of the central cell. Cases were found, too, in which all the canal cells were rounded off and egg-like, a plurilocular gametangium having thus arisen. The author concludes that the whole axial cell-row in the archegonium is homologous with the spermatogenous tissue in the antheridium. Astral rays were sometimes demonstrated in the egg-cell.—The 3rd study contains a description of the development of the sporophyte in the same species, including an account of sporogenesis. In its early stages the sporophyte conforms to the type characteristic of the Jungermanniales, the hypobasal cell forming an haustorium and the epibasal cell giving rise to capsule, seta and foot. The seta shows irregularities in the arrangement of its cells, and the foot is far less conspicuous than in the acrogynous Jungermanniales, not becoming clearly defined until the development of the sporophyte is far advanced. In the capsule, the wall, the sporogenous tissue, and the elaterophore soon become differentiated, and the spore-mother cells normally show the characteristic furrowing into 4 regular lobes, although irregularities sometimes occur. In sporogenesis neither centrospheres nor centrosomes were demonstrated. The heterotypic division is quickly followed by the homotypic, and no cell walls are laid down until the completion of the latter. The haploid chromosome number is 10.—O. Heilborn.

2659. FOURNIER, G. *Barbula Hornschuchiana* Sch. Bull. Acad. Sci. Arts et Belles-Let. Dijon 1922: 104. 1922.—The author reports 3 stations for the *Barbula* in the vicinity of Dijon, France, these being the first definite records for the department of Côte-d'Or.—A. W. Evans.

2660. FRÉMY, P. *Marchantia polymorpha* L. Bull. Soc. Linn. Normandie 4: 25. 1921.—Several stations for the *Marchantia* in the department of the Manche, France, are here cited.—A. W. Evans.

2661. GAMS, H. *Bryophyta*. Ber. Schweiz. Bot. Ges. 26-29: 106-124. 1920.—In this section on bryophytes, included under the heading *Floristik und Fortschritte*, the author first enumerates 15 books and papers on the mosses and hepatics of Switzerland, published 1911-1920. This is followed by a list of 205 mosses and 35 hepatics, for which new Swiss stations are cited, these being based partly on the literature and partly on unpublished reports. Among the hepatics *Lophozia opacifolia* Culmann is proposed as a new subspecies or variety of *L. incisa* (Schrad.) Dumort.—A. W. Evans.

2662. GENTY, P. Une hépatique nouvelle pour la Côte-d'Or, le *Metzgeria pubescens*. [A new hepatic for Côte-d'Or, *Metzgeria pubescens*.] Bull. Acad. Sci. Arts et Belles-Let. Dijon 1922: 139. 1922.—The author announces his discovery of the *Metzgeria* near Gevrey, this being the 1st record for the department of Côte-d'Or, France.—A. W. Evans.

2663. GUINET, AUG. Quelques sphaignes des environs de Geneve. [*Sphagna* from the vicinity of Geneva.] Rev. Bryologique 49: 9-11. 1922.—The author enumerates 11 species and 6 varieties of *Sphagnum* from the vicinity of Geneva, Switzerland, giving in each case full data regarding localities. The specimens upon which the list is based were determined by C. Meylan.—A. W. Evans.

2664. HERZOG, TH., UND H. PAUL. Beiträge zur Moosflora Bayerns. [Contributions to the moss flora of Bavaria.] Krypt. Forsch. Bayer. Bot. Ges. München 5: 353-361. 1920.—The authors give lists of noteworthy Bavarian bryophytes, based mainly on their own collections of 1919. The species are arranged under regions as follows, each being accompanied by full data regarding localities: Limestone Alps, 13 hepatics, 51 mosses; Flysch Foothills, 6 hepatics, 19 mosses; Plateau (south of the Danube), 10 hepatics, 33 mosses; North Bavaria (north of the Danube), 10 hepatics and 24 mosses. New varieties are described under *Brachythecium rivulare*, *Mniobryum albicans* and *Orthotrichum nudum*, and the following hepatics are reported for the 1st time from Bavaria: *Cephaloziella Limprichtii*, *Frullania Jackii* and *Lophozia confertifolia*.—A. W. Evans.

2665. LEE, WILLIAM A. Mosses and hepatics of Sligo and Leitrim. Irish Nat. 30: 81. 1921.—The author enumerates 12 mosses and 4 hepatics from the counties of Sligo and Leitrim in Ireland, each species being accompanied by data regarding localities. Four of the mosses represent new "vice county" records.—A. W. Evans.

2666. LEE, W. A., AND W. G. TRAVIS. The Muscineae of the Wirral. Lancashire and Cheshire Nat. 14: 35-48. 75-91, 130-142. 1921.—The Wirral is a small peninsula south of Liverpool bounded on the north by the river Mersey and on the south by the Dee. As past or present inhabitants of this area the authors enumerate 183 species of Musci and 47 species of Hepaticae. Of these species 13 mosses and 16 hepatics are recorded for the 1st time, while 44 mosses and 7 hepatics seem to have become extinct during the last half century. The disappearance of these species, most of which are corticolous or saxicolous in habit, is attributed to the pollution of the atmosphere by smoke. In connection with each of the species listed full data are given regarding localities and relative frequency.—A. W. Evans.

2667. NICHOLSON, W. E. *Southbya nigrella* (De Not.) Spr. in Britain. Jour. Bot. 60: 67-68. 1922.—The discovery of this rare hepatic in Dorsetshire, England, is announced, this being the 1st record for the British Isles. The species is widely distributed in the Mediterranean region and is known also from the northern and western parts of France.—A. W. Evans.

2668. POTIER DE LA VARDE, R. Contribution à la flore bryologique du département de la Manche. [Contribution to the bryophyte flora of the department of the Manche.] Bull. Soc. Linn. Normandie 5: 61-68. 1922.—The author gives a report on his collections made in the vicinity of Granville, Ducey and Mortain, France. His list of species includes 50 mosses and 20 hepatics, each accompanied by data regarding stations. Twelve of the mosses and 2 of the hepatics represent additions to the flora of the department of the Manche.—A. W. Evans.

2669. SCHNYDER, A. *Botanische Beobachtungen in Wädenswil und Umgebung, 1920-1921.* [Botanical observations in Wädenswil and vicinity.] Vierteljahrsschr. Naturf. Ges. Zurich 67: 70-74. 1922.—The author notes the occurrence of various species in and near Wädenswil in northern Switzerland. Most of the forms reported upon are mosses, liverworts or introduced spermatophytes.—*John H. Schaffner.*

2670. SCHÜTZE, K. T. *Leuchtmoss.* [Luminous moss.] Ber. Tätigkeit Naturw. Ges. Isis in Bautzen 1916/1918: 70-71. 1918.—The author describes his discovery of the luminous moss, *Schistostega osmundacea*, and suggests that it may be responsible for the mythical gold caverns of mountainous regions.—*A. W. Evans.*

2671. THÉRIOT, I. *Contribution à la flore bryologique du Chile.* [Contribution to the bryological flora of Chile.] Rev. Chilena Hist. Nat. 27: 9-15. Pl. 2. 1923.—This is the 5th paper published by the author under the above title [see Bot. Absts. 12, Entry 587]. The report is largely based on collections made by M. Bertho, A. Breuil, N. Costes and F. Jaffuel and enumerates 14 species, the following being proposed as new and figured on the accompanying plate: *Encalypta Berthoana*, *Grimmia perplexa*, *Orthotrichum subrupestre* and *Tortula Jaffueli*. In addition a new variety is proposed under *Brachysteleum chimborazense* (Spruce), apparently a new combination, and another new combination is *Tortula amblyophylla* (Mont.), based on *Desmatodon amblyophyllus* Mont. *Tortula subglacialis* Thér., a species proposed in 1917, is reduced to synonymy under *Barbula depressa* Sull. Many critical notes are included in the paper.—*A. W. Evans.*

2672. TRAUTMANN, C. *Beitrag zur Moosflora der Oberlausitz.* [Contribution to the moss flora of the Upper Lausitz.] Ber. Tätigkeit Naturw. Ges. Isis in Bautzen 1916/1918: 60-66. 1918.—The author publishes the results of his bryological explorations in the vicinity of Bautzen, Saxony, extending over a period of 30 years. The district studied, known as the Upper Lausitz, presents a great variety of habitats favorable for bryophytes, 238 mosses, 26 peat mosses, and 70 hepatics being listed, with data regarding stations and relative frequency. Of the mosses 7 species represent additions to the flora of Saxony.—*A. W. Evans.*

2673. WATSON, W. *Spitzbergen liverworts.* Jour. Botany 60: 327-330. 1922.—The author gives a report on a collection made in 1921 by V. S. Summerhayes, a member of the Oxford Expedition to Spitzbergen. He lists 25 species, with data regarding stations, and adds critical remarks in a few cases. At the close of the paper he notes the absence of all holoarctic species and also of a number of other species previously recorded from the Island.—*A. W. Evans.*

2674. WEHRHAHN, W. *Flora der Laub- und Lebermoose für die Umgebung der Stadt Hannover.* *Eine geographisch-floristische Heimatkunde für das Gebiet.* [Flora of the mosses and liverworts of the city of Hanover and vicinity. A contribution to the plant geography of the region.] 8vo, 126 p., 10 pl., 1 map. C. V. Engelhard & Co.: Hanover, Germany, 1921.—The author records the results of his studies on the bryophytes of Hanover and vicinity extending over a period of many years. After a short introduction in which he narrates the history of Hanoverian bryology and outlines the boundaries of the region investigated, he gives descriptions of the various types of vegetation represented and especially of those where bryophytes are abundant. Although these descriptions emphasize the bryological features they include also full accounts of the woody and herbaceous vascular plants and are thus of interest from the standpoint of floristic plant geography in general. The descriptive part of the work is followed by a systematic part in which 79 species of hepatics and 304 of mosses are enumerated, each species being accompanied by full notes regarding habitats, stations and collectors and, in a very few cases, by critical remarks. One of the plates represents *Aplozia riparia* var. *rivularis*, while the others illustrate (in half-tone reproductions) characteristic types of vegetation.—*A. W. Evans.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

D. S. WELCH, *Assistant Editor*

(See also in this issue Entries 2255, 2267, 2271, 2278, 2476, 2776, 2784, 2787, 2796, 2805, 2919, 3066, 3068, 3069, 3087, 3088, 3098)

FUNGI

2675. BATAILLE, F. Flore analytique et descriptive des Hyménogastracées d'Europe. [Analytic and descriptive flora of the European Hymenogastraceae.] Bull. Trimest. Soc. Mycol. France 39: 157-196. 1923.—The author gives some introductory notes on the mycelium, fruit-bodies and occurrence of members of the family. He distinguishes 18 European genera with about 100 species. The genera *Phlyctospora* Corda and *Gastrosporium* Mattirollo have been excluded from the family. The paper contains keys to the genera and species. The family is divided into 2 sections: I, *Oblongispori*, with the subsections *Laevispori* and *Rugosispori*, and II, *Rotundispori*, with the subsections *Lacunosi* and *Facti*. No new forms are described.—S. Blumer.

2676. BELLAING, J. DE. Quelques observations sur les champignons des environs de Tours pendant le trimestre janvier-mars 1923. [Some observations on the fungi of the environs of Tours during January-March 1923.] Bull. Trimest. Soc. Mycol. France 39: 87-88. 1923.

2677. BIJL, PAUL A. VAN DER. A contribution to our knowledge of the Polyporeae of South Africa. South African Jour. Sci. 18: 246-293. 1922.—This paper deals with South African Polyporeae belonging to the genera *Polyporus*, *Fomes*, *Trametes*, *Hexagona*, *Favolus*, *Laschia*, *Lenzites*, and *Daedalea*. Keys are given to the genera and species and each species is described. The following new species are described: *Polyporus durbanensis*, *P. Trichiliae*, *P. ochroporus*, *P. flexilis*, *Trametes varians*, *T. griseo-lilacina*, *T. Keetii*, *T. tomentosa*, *Daedalea Hobbsii*.—E. M. Doidge.

2678. BIJL, PAUL A. VAN DER. A fungus—*Gibellula Haygarthii* sp. n.—on a spider of the family Lycosidae. Trans. Roy. Soc. South Africa 10: 149-150. 4 fig. 1922.—This new species is described and illustrated.—E. M. Doidge.

2679. BIJL, P. A. VAN DER. A host list of the Polyporeae occurring in the Union of South Africa. Kew Bull. 1922: 177-182. 1922.—The number of species of fungi listed are: *Daedalea* 2, *Favolus* 6, *Fomes* 14, *Gloeoporus* 1, *Hexagona* 7, *Laschia* 1, *Lenzites* 4, *Polyporus* 51, and *Trametes* 18. The following undescribed species are given as new: *Daedalea Hobbsii*, *Polyporus durbanensis*, *P. flexilis*, *P. ochroporus*, *P. Trichiliae*, *Trametes griseolilacina*, *T. Keetii*, and *T. tomentosa*.—T. J. Fitzpatrick.

2680. BIJL, PAUL A. VAN DER. Fungi of the Stellenbosch District and its immediate vicinity. Trans. Roy. Soc. South Africa 10: 281-288. 1922.—The list contains 98 genera, 148 identified species, and 20 fungi identified only as to genera.—E. M. Doidge.

2681. BIJL, PAUL A. VAN DER. Notes on some interesting or little known South African fungi. South African Jour. Sci. 18: 345-348. 1922.—Notes are given on the morphology and occurrence of *Campanella Buttneri*, *Geaster coronatus*, *G. saccatus*, *Catastoma anomala*, *Lanopila Wahlbergii*, *Hymenochaete tenuissima*, *Lycoperdon djurense*, *Cladoderis spongiosa*, and *Pleurotus applicatus*.—E. M. Doidge.

2682. BIJL, PAUL A. VAN DER. On some fungi from the air of sugar mills and their economic importance to the sugar industry. South African Jour. Sci. 18: 232-233. 1922.—Six species are mentioned: *Cladosporium* sp., *Penicillium divaricatum*, *Aspergillus flavus*, *A. parasiticus*, *A. repens-glaucus*, *Monilia* sp. These are, under favourable conditions, amongst the more important of the microorganisms responsible for the deterioration of sugar.—E. M. Doidge.

2683. BIJL, PAUL A. VAN DER. Some South African Stereums. Trans. Roy. Soc. South Africa 10: 151-157. Fig. 1-9. 1922.—Eleven species of *Stereum* are recorded, *S. durbanense* and *S. tomentosum* being described as new.—E. M. Doidge.

2684. BILLIARD, M. GEORGES. Milieux favorisant la culture des moisissures. [Nutrient media for mold fungi.] Bull. Trimest. Soc. Mycol. France. 39: 69-72. 1923.—The author recommends as nutrient media for the culture of pathogenic mold fungi the media of Raymond and Billiard. The former consists of 1 volume of carrot and 1 volume of egg (white and yolk). The latter is composed of 2 volumes of carrot and 1 volume of milk. Notes on the preparation of these media are given. Mycelium and conidia are produced in a short time. Perithecia of *Eurotium* and *Amblyosporium luteo-album* have developed on these media.—S. Blumer.

2685. BLOCHWITZ, ADALBERT. Eine allgemeine Ursache spontaner Verlustmutationen bei Schimmelpilzen. [A common cause of loss mutation in the molds.] Ber. Deutsch. Bot. Ges. 41: 205-208. 1923.—The author worked with *Aspergillus versicolor*. He finds that the age of the culture from which new cultures are made might lead to apparent loss mutations. Some of the green color-forming materials are lost through age and give rise to blue or colorless forms which remain unchanged. This might easily occur in nature where conidia live over a long period.—Hally Jolivet Saz.

2686. BOSE, S. R. The fungi cultivated by the termites of Burkunda, Chilka Lake, India. Rec. Indian Mus. 25: 253-258. 1923.—Combs of *Odontotermes obesus*, *O. obesus* var. *oculatus*, *Eurytermes assmuthi*, and *Microtermes anandi* were investigated. Fresh combs cleared of termites and placed under bell jars on wet blotting paper were covered by a dense white mycelium after 1 day; after 2 days the stromata of *Xylaria nigripes* arose. Most of the xylaria from the cultures showed only conidial stages, but that from the comb of *Odontotermes obesus* var. *oculatus*, kept in culture for a longer time, produced a number of rounded perithecia with asci and black oval spores $4 \times 2 \mu$.—The edible mushroom *Collybia albuminosa* (Berk.) Petch was collected from the above-ground part of *O. obesus* nests during the rainy season. The stalks extended down to the combs. *Entoloma microcarpum* B. & Br., common in Bengal, was found growing on the moist walls of the mounds, without connection with the combs. Chemical analysis of *Collybia albuminosa* is given, and other work on fungi cultivated by termites is reviewed.—S. R. Bose.

2687. BOURDOT, H., ET A. GALZIN. Hymenomycètes de France. (IX. Meruliés.) Bull. Trimest. Soc. Mycol. France 39: 96-118. 1923.—The present instalment contains descriptions and keys to the genera and species of the family Meruliaceae. The following genera are described: *Phlebia*, *Plicatura*, *Merulius*, *Gyrophana*, *Coniophora*, *Coniophorella*, and *Jaapia*. *Coniophora medius* and *C. prasinoides* are described as new.—S. Blumer.

2688. BROOKS, F. T. Presidential address. Some present-day aspects of mycology. Trans. British Mycol. Soc. 9: 14-32. 1923.—The author considers mainly the origin and phylogeny of the fungi, the relation of mycology to plant pathology, and the training of mycologists and plant pathologists, devoting most space to the first and least to the last topic. It is pointed out that far less is known about the phylogeny of plants than was thought a few years ago. The author does not believe that fungi were derived from algae but that they constitute "an enormous group of organisms of extreme age and probably of protist origin, which was developed upon independent lines, and which shows the same kind of differences between its constituent divisions as do other large phyla of plants and animals." Coöperation between systematic mycologists and plant pathologists is urged and it is stated that descriptions of fungi based upon characters shown on natural substrata should be supplemented whenever possible by an account of their behavior upon standard media under controlled conditions. It is urged that plant pathologists must first of all be botanists and must also be brought into contact with growing crops.—W. B. McDougall.

2689. BROOKS, R. ST. JOHN, AND MABEL RHODES. A list of fungi etc. maintained in the national collection of type cultures. Trans. British Mycol. Soc. 9: 95-99. 1923.

2690. BUCHET, S. Une curieuse station de *Reticularia Lycoperdon*. [A curious locality for *Reticularia Lycoperdon*.] Bull. Trimest. Soc. Mycol. France 39: 156. 1923.—This fungus was found on an old boat displayed in a museum.—S. Blumer.

2691. BUCKLEY, W. D. New British Discomycetes. Trans. British Mycol. Soc. 9: 43-47. 1923.—*Ramsbottomia* is described as a new genus. The following species are described as new: *Ramsbottomia lamprosporoidea*, *Lamprospora campylopodis*, and *Ciliaria caudata*. *Neotiella Hetieri*, *Lamprospora dictydiola* and *Saccobolus globulifer* are described as new to the British Isles.—W. B. McDougall.

2692. CHARLES, J. H. V. Spore formation in *Rhacodium cellare* Pers. Trans. British Mycol. Soc. 9: 94-95. 1923.—*Rhacodium cellare*, the fungus which covers bottles in wine cellars with cobwebby growths, is not one of the "mycelia sterilia" as stated in the standard works on fungi. It belongs to the family Dematiaceae and produces conidia capable of germination.—W. B. McDougall.

2693. CLAUSSEN, P. Entwicklungsgeschichtliche Untersuchungen über den Erreger der als "Kalkbrut" bezeichneten Krankheit der Bienen. [Developmental-history investigations concerning the exciter of the so-called "lime-brood" disease of bees.] Arbeit. Biol. Reichsanstalt Land- u. Forstw. 10: 467-521. Pl. 3-5, fig. 1-24. 1921.—"Kalkbrut" is a fungous disease of the honey-bee that came to the attention of the author in 1912, and a number of reports of its cause and occurrence have appeared since in German literature. In 1916, Massen gave the fungus the name *Pericystis Apis*, placing it along with *Pericystis Alvei* Betts, the cause of a similar disease in England. Claussen states that the 2 fungi differ rather widely and reserves his determination of the "Kalkbrut" organism until he has concluded his studies of *P. Alvei*. The present paper describes in detail the development of the mycelium, antheridia, and oogonia of the "Kalkbrut" fungus. The mycelium is heterothallic, the male thallus growing more vigorously. At points of contact between male and female hyphae the sexual organs develop. The spores within the mature fruit body are grouped in a number of spore balls. The spores of a given fruit body, or of a separate spore ball, may produce thalli of both sexes. The fungus can attack all stages of the bee from the egg to the pupa, although rarely the pupa. The mycelium overgrows the cells of the honey comb and then penetrates the larvae, which become filled with hyphae and later harden into brownish white mummies. The disease occurs throughout Germany, but is most common in the western half.—W. S. Beach.

2694. DAVIS, J. J. Notes on parasitic fungi in Wisconsin. VII. Trans. Wisconsin Acad. 20: 399-411. 1 pl., 1 fig. 1922.—Notes are given on fungi collected during the season of 1918 in Wisconsin. The following are described as new: *Synchytrium pulvereum* on *Laportea canadensis*, *Septoria Coreopsisidis* on *Coreopsis palmata*, *Gloeosporium balsameae* on *Abies balsamea*, *Ramularia minax* on *Solidago rigida*, *Fusicladium radiosum* (Lib.) Lind. var. *balsamiferae* on *Populus balsamifera*, *Cercospora rosicola* var. *undosa* on *Rosa blanda*. The following new combinations are noted: *Septoriopsis longispora* (Pk.), (*Cercospora longispora* (Pk.), *S. leptosperma* (Pk.), (*Cercospora leptosperma* (Pk.).—E. L. Fisk.

2695. DAVIS, J. J. Notes on parasitic fungi in Wisconsin VIII. Trans. Wisconsin Acad. 20: 413-431. 2 pl., 3 fig. 1922.—Notes are presented pertaining to fungi collected during the season of 1919 in Wisconsin. The following new species with hosts are described: *Sphaerulina pallens* on *Carex*, *Phacidium planum* on *Pinus Strobus*, *P. expansum* on *Picea mariana*, *P. balsameae* on *Abies balsamea*, *Lophodermium Thuyae* on *Thuja occidentalis*, *Stagonospora tetramera* on *Carex (riparia?) Piggotia Vaccinii* on *Vaccinium canadense*, *Gloeosporium bicolor* on *Quercus bicolor*, *Cladosporium astericola* on *Aster umbellatus*, *Cercospora tuberculella* on *Convolvulus sepium*, *C. tortipes* on *Veronica scutellata*. New combinations, as follows, are suggested: *Rhynchosporium secalis* (Oud.) (*Marsonia secalis* Oud., *Rhynchosporium graminicola* Heinsen), *R. alismatis* (Oud.) (*Septoria alismatis* Oud.). An index covering lists VII and VIII is appended.—E. L. Fisk.

2696. DOIDGE, E. M. A fungus of economic importance on the avocado. Bothalia 1: 179-186. Fig. 1-7. 1922.—A disease of avocado trees occurring at Louis Trichardt in the Northern Transvaal is described, characterized by the discoloration and death of the twigs and small branches. This has been shown to be caused by *Physalospora Perseae* n. sp. The fungus is described in detail. In its early stages the disease could probably be arrested by surgical methods and spraying with Bordeaux mixture.—E. M. Doidge.

2697. DUMÉE ET BURLET. Note sur le *Leucangium Carthusianorum* Tul. [Note on *Leucangium Carthusianorum* Tul.] Bull. Trimest. Soc. Mycol. France 39: 62-64. Fig. 1. 1923.—

Some taxonomic and critical remarks are made on *Leucangium* (Picoa) *Carthusianorum* Tul. and *L. ophthalmosporum* Quélet.—*S. Blumer*.

2698. GOLDSTEIN, BESSIE. Resting spores of *Empusa Muscae*. Bull. Torrey Bot. Club 50: 317-328. Pl. 19. 1923.—Resting spores, which are formed late in the development of *Empusa Muscae*, were found in dried bodies of the host. These resting spores seem to be chlamydospores which occur most frequently as terminal swellings on the short hyphal fragments, intercalary in the hyphal filaments, or by apparent budding from the hyphal bodies. They are described as "rounded cells, with smooth, evenly thickened walls, and contain many nuclei."—*P. A. Munz*.

2699. HAGGAN, ISME A. On *Dematium pullulans* De Bary. Trans. British Mycol. Soc. 9: 100-107. 1923.—Some mycologists have thought that *Dematium pullulans* and *Cladosporium herbarum* are different forms of the same fungus. Others have considered *Dematium pullulans* as a collective name for the conidial stages of several Ascomycetes such as *Plowrightia ribesia*, *Sphaerulina intermixta*, and *Fumago vagans*. After extensive cultural studies the author concludes that there is no direct connection between *Dematium pullulans* and *Cladosporium*, *Plowrightia*, or *Fumago*. She has not yet had an opportunity to study a possible relationship with *Sphaerulina*.—*W. B. McDougall*.

2700. HAKE, WINIFREDE L. British Laboulbeniaceae. A catalog of the British specimens in the Thaxter collection at the British Museum. Trans. British Mycol. Soc. 9: 78-82. 1923.

2701. HARPER, E. T. Species of *Lentinus* in the region of the Great Lakes. Trans. Wisconsin Acad. 20: 365-385. 14 pl. 1922.—A synopsis is presented of the genus *Lentinus* with descriptions and notes on forms collected by the author. The unusual quality of the illustrative material makes this a valuable addition to our knowledge of this genus.—*E. L. Fisk*.

2702. HASTINGS, SOMERVILLE. An alpine form of *Anellaria separata*. Trans. British Mycol. Soc. 9: 34-35. Pl. 1. 1923.—Specimens of *Anellaria separata* collected in the Alps between 6,000 and 8,000 feet altitude had unusually large caps and short stems.—*W. B. McDougall*.

2703. HORNE, A. S., AND H. S. WILLIAMSON. The morphology and physiology of the genus *Eidamia*. Ann. Botany 37: 393-432. 23 fig. 1923.—The salient morphological features of 3 species of *Eidamia*, including *E. viridescens* and *E. catenulata* which are apparently new to science, are described. The reactions which these species exhibit when grown in various media including sugars, soluble pectin, protein, organic acids, and various other substances, are compared and contrasted. The growth limits of the species in relation to H-ion concentration are approximately determined.—*Margaret Newton*.

2704. JOACHIM, M. L. Notes sur les principales espèces, récoltées pendant les excursions de la session mycologique de 1922, à Lyon. [Notes on the principal species collected during the excursions of the mycological session of 1922 at Lyon.] Bull. Trimest. Soc. Mycol. France 39: xxiii. 1923.—This is a list of 24 Hymenomycetes, collected in the environs of Lyon.—*S. Blumer*.

2705. JONES, EDITH SEYMOUR. Taxonomy of the *Sclerotinia* on *Helianthus annuus* L. Phytopathology 13: 496-500. Fig. 1. 1923.—A morphological study of the *Sclerotinia* causing a stemrot and wilt of sunflower has been made and leaves no doubt of the identity of this fungus with *Sclerotinia libertiana* Fekl. A disease of sunflower and other species of *Helianthus*, caused by this species, has been mentioned frequently in European works on plant diseases.—*B. B. Higgins*.

2706. JUEL, H. O. Mykologiske Beiträge VIII. [Mycological contributions VIII.] Ark. för Bot. 18: 1-15. Fig. 1-3. 1922.—Aecidia were developed on *Anemone hepatica* from inoculations with sporidia of *Puccinia Actaeae-Agropyri* from *Triticum caninum*, thus giving a new aecidal host. Additional experiments demonstrated that *Aecidium mamillatum* (Sommerf.) Lagerh. and *P. Dietrichiana* Tranzsch. are distinct from this species. The genus *Chaonia* is undoubtedly referable to the Pucciniaceae. Hitherto only the conidial stage of *Crinula caliciiformis* Fr. has been known, though Saccardo has regarded it as congeneric with *Ditiola mucida* Schulzer and has referred both under the name *Crinula* to the discomycetes. In the present paper the writer states that he has found the conidial and apothecial stages of *Crinula caliciiformis* associated. He describes the apothecia.—*O. Heilborn*.

2707. KILLIAN, CH. *Le Polythrincium Trifolii* Kunze, parasite du trèfle. [P. *Trifolii* parasitic on clover.] Rev. Path. Vég. et. Entomol. Agric. 10: 202-219. Fig. 1-14. 1923.—In fields of Alsace *Trifolium incarnatum* and *T. pratense* were found heavily infected with *Polythrincium Trifolii*; the more vigorous the clover the heavier the infection. The organism can not be grown on artificial culture media. The relation between the parasite and host is necessarily a quasi-symbiotic one; infected leaves die prematurely and fall early. Conidia are formed throughout the summer, and pycnidia and perithecia are formed in the fallen leaves during the winter, the asci maturing in the spring. The ascospores are 2-celled. The name *Phyllachora Trifolii* given by Saccardo is erroneous. The fungus should be called *Plowrightia Trifolii*.—J. Dufrenoy.

2708. KONRAD, M. P. Notes critiques sur quelques champignons du Jura. [Critical notes on some fungi of the Jura.] Bull. Trimest. Soc. Mycol. France 39: 27-45. Pl. 1-3 (col.). 1923.—The paper contains descriptions of 15 fungi, chiefly Hymenomycetes, collected by the author in the Swiss Jura. Taxonomic relationships are discussed in some critical or little known species. *Morchella elata* Fries var. *nivea* n. var. is described.—S. Blumer.

2709. LAGARDE, J. Sur quelques champignons comestibles accidentellement vénéneux. [On some edible fungi accidentally poisonous.] Bull. Trimest. Soc. Mycol. France. 29: 127-130. 1923.—The writer mentions some cases of poisoning by edible fungi, e.g., *Collybia fusipes* and *Boletus granulatus*. It seems that edible fungi acquire toxic properties in some cases.—S. Blumer.

2710. LLOYD, C. G. Mycological notes. No. 66. 1105-1133, fig. 2018-2148. Cincinnati, Ohio, Feb. 1922.—The following new species are described and illustrated: *Panus conglomeratus*, New Mexico; *Mucronella ramosa*, Alabama; *Trametes quercina* and *Hypoxyylon fissum*, New York; *Polystictus lavendulus*, Minnesota; *Thelephora dubia*, Porto Rico; *Polyporus propinquus*, the Bahamas; *Crucibulum albosaccum*, Argentina; *Lenzites ochracea*, *Polyporus hiascens*, *Fomes intertextus*, *Polystictus flexibilis*, *Dendrocladium peckoltii*, *Stereum sclerotoides*, *Bovistoides Torrendii*, *Trametes roseoporus*, *Cordyceps olivacea*, *Kretzschmaria apoda*, and *Haematomyces eximus*, Brazil; *Rimbachia spadicea*, *Grandinia cervina*, *Polyporus minuto-durus*, *Polystictus immaculatus*, *Hysterangium eucalyptorum*, and *Stereum xylostroma*, Ecuador; *Polystictus argenteus*, South Africa; *Polyporus granulatus* and *Xylaria Vanderystii*, Belgian Congo; *Clavaria capitata*, *Polyporus rugatus*, *P. magnoporus*, and *Isaria Froggattii*, Australia; *Phlebia castanea*, *Merulius aurantius*, *Polyporus fusco-dresdensis*, *P. maculatissimus*, and *Trametes varia*, Tasmania; *Polyporus aureofulvus*, *Bovistella nigrica*, and *Catastoma purpurea*, New Zealand; *Lentinus fusco-exactus*, Guam; *Daedalea Boseii*, India; *Polyporus fijii*, Fiji; *Trametes nigro-plebeia*, *T. borneoensis*, and *Trogia borneoensis*, North Borneo; *Polyporus kanehirae*, Formosa; *Hydnum singaporensis*, *Polyporus retro-ater*, and *Trametes retro-picta*, Singapore; *Lentinus elmerianus*, *L. revelatus*, *Lenzites pertenius*, *Pterula luzonensis*, *Polystictus dubitativus*, *Laschia favoloides*, *Auricularia peltata*, *Tremella philippiensis*, *Merulius consimilis*, and *Polyporus manilaensis*, Philippines; *Lenzites huensis*, *Daedalea sinensis*, and *Stereum sinense*, China; *Hydnum pygmaeum*, *Lenzites yoshinaga*, and *Aleurodiscus reflexus*, Japan. Notes are given on a variety of other species.—Photographs of W. A. Setchell and of A. Yasuda are included in the illustrations.—Lists of fungi are noted as having been received from various parts of the U. S. A., Canada, Mexico, Bahamas, Porto Rico, Cuba, Ecuador, Brazil, Trinidad, Costa Rica, Sumatra, Guam, Philippines, North Borneo, New Zealand, Australia, Malay, Japan, Tasmania, India, South Africa, Switzerland, Sweden, and Italy.—L. O. Overholts.

2711. LLOYD, C. G. Mycological notes. No. 67. 1137-1168, fig. 2149-2262. Cincinnati, Ohio, July, 1922.—A new genus, *Heterotextus*, is described in the Dacryomycetaceae. New species are described and illustrated as follows: *Polyporus whetstonei*, Minnesota; *P. fusco-mutans*, Ohio; *P. Munzii*, California; *Ptychogaster subiculoides* and *Stereum laetum*, Canada; *Merulius conchoides*, *Polyporus ursinulus*, *Favolus parviporus*, and *Guepinia crenata*, Ecuador; *Xylaria exacuta*, *Trametes sulcata*, *Daedalea stratosata*, *Tremella ater-globosa*, and *Stereum novomolle*, Brazil; *Ptychogaster croceus*, Australia; *Scleroderma caespitocum*, New Zealand; *Polystictus purus* and *P. similis*, Java; *Polyporus Sandakanii*, *Polystictus glabro-ringens*, and *Auricularia stellata*, North Borneo; *Dacryomyces dubius*, *Calocera rufa*, *C. cuneata*, *Egidia*

plumbea, *Heterotextus flavus*, *Tremella crispa*, *Polystictus glabro-tabacinus*, *Clavaria alba*, and *Stereum nitens*, Tasmania; *Polyporus Guhae*, *P. friabilis*, *Favolus bengala*, *Fomes rufo-laccatus*, and *Trametes Kariae*, India; *Polystictus prosector* and *P. rosea-brunnea*, China; *Trametes roseozonata*, *Polystictus albo-regularis*, *Daedalea mollicula*, *Hymenochaete intricatum*, and *Irpez tabacinoides*, Japan; *Hexagona fusco-glabra*, *H. flavo-fusca*, *H. atra*, *H. caliginosa*, *H. scruposa*, *Calocera fusco-basis*, *Hydnochaete philippensis*, *Daedalea maculata*, *D. reflexa*, *Polystictus sepia*, *P. incisus*, *P. tenuiculus*, *Polyporus areosus*, *Fomes Graffi*, *F. agglutinatus*, *Lenzites isabellina*, *Lentinus lateripes*, *Trametes truncata*, *Favolus glandulosus*, *F. lagunae*, *F. roseus*, *F. scabro-lineatus*, and *Geaster glaber*, the Philippines; *Polyporus multilobatus* and *Stereum dichroum*, the Bahamas; *Pterula landelphiae*, *Tremella crassa*, *Auricularia flava*, and *Merulius gelatinosus*, Africa.—Photographs and brief biographies are presented of K. Miyabe of Japan, and of E. B. Sterling, of Trenton, New Jersey.—The usual list of correspondents and their specimens enumerates plants from various parts of the U. S. A., Canada, the Bahamas, Brazil, Costa Rica, Australia, Ceylon, Tasmania, Java, New Zealand, China, Japan, the Philippines, Africa, Italy, and Switzerland. The genera *Octaviana* and *Archangeliella* of the Hymenogastraceae as well as *Catastoma* of the Lycoperdaceae and *Naematelia* of the Tremellaceae are given extended treatment.—L. O. Overholts.

2712. LLOYD, C. G. *Mycological notes*. No. 68. 1169–1184, fig. 2263–2388. Cincinnati, Ohio, Jan. 1923.—Two new genera, *Hypodiscus* and *Globosopyreno*, are described in the Xylariaceae. Extended notes on *Rhizopogon*, *Lanopila*, and *Hymenogaster*, all of the Hymenogastraceae, are presented. The following new species are described: *Rhizopogon superdubius*, Iowa; *Tylostoma Finkii*, Ohio; *Catastoma Townei*, California; *Xylaria squamosa* and *Lanopila yukonensis*, Canada; *Tremellodendron* (?) *dubia*, *Cordyceps concurrens*, *Xylaria cuneata*, and *Hypodiscus Rickii*, Brazil; *Rhizopogon Vittadinii*, and *Lentinus subglaber*, Italy; *Melanogaster Wilsonii* and *Lycoperdon retis*, Australia; *Xylaria humosa*, Java; *Irpez Miyabei* and *Globosopyreno ater*, Japan; *Hydnum deceptivum*, *Xylaria tenuis*, *X. flexa*, *X.* (?) *repens*, and *Hypoxylon nucele*, the Philippines; *Calvatia macrogemmae*, *Hysterangium niger*, *Rhizopogon radicans*, *Lanopila capensis*, *Rhizina resupinata*, and *Isaria Abutii*, Africa.—The illustrations include photographs of A. de Jacewski and of Fedor Bucholtz, both of Russia.—L. O. Overholts.

2713. LLOYD, C. G. *Mycological notes*. No. 69. 1185–1218, fig. 2389–2499. Cincinnati, Ohio, July, 1923.—Lists of specimens are given as having been received from correspondents in various parts of the U. S. A., Canada, Switzerland, England, France, Italy, Belgium, Brazil, Ecuador, Bahamas, Africa, India, Australia, New Zealand, Malay, Singapore, China, Japan, Philippines, North Borneo, Tasmania and Sumatra. A new genus, *Paucithecium* is described in the Xylariaceae. Extended notes on the genera *Entonaema* (Xylariaceae), *Glaziella* (Endogonaceae), *Trichocoma* (Tuberaceae), and *Penicillioopsis* (Hypocreaceae or Tuberaceae), are given. Comments on plants in the herbaria of Mattiolo, Cesati, and Saccardo are included. The following species are described as new: *Dacryomyces cerebriformis*, Massachusetts; *Calocera vermicularia*, New York; *Polysaccum crassipes*, Colorado; *Stereum ardoisiacum*, Canada; *Polystictus subochraceus*, *Polyporus magnovarius*, *Isaria mycelioides*, *I. xylariaformis*, *Cladoderris Rickii*, *Sirobasidium brunnea*, *Lycoperdon foliicola*, and *Instilale ochracea*, Brazil; *Trametes bruneo-flava*, Costa Rica; *Polyporus Poncei*, *P. haedinus*, *Lentinus nigro-glabrus*, *Xylaria bifigurata*, and *X. Reinkingii*, the Philippines; *Polyporus labis*, *P. zonifer*, *Polystictus turgidus*, *Trametes tenuo-rosea*, *Stereum nigro-rugosum*, *Paxillus ferruginosus*, *Hydnum seriatum*, and *Lentinus Ramosii*, North Borneo; *Polystictus albo-vestitus*, *Merulius candidus*, *Septobasidium pteruloides*, *Tylostoma adhaerens*, and *Stereum ochraceum*, Australia; *Polyporus sinensis*, China; *Lycogalopsis reticulatus*, Japan; *Favolus samoensis*, Samoa; *Polyporus chocolatus*, India; *Thelephora crustosa*, *Hydnum wellingtonii* and *Bovista purpurea*, New Zealand; *Stereum elongatum*, Dutch East Indies; *Fomes pseudopetchii* and *Polystictus praegracilis*, Sumatra; *Hexagona velutino-glabra*, *H. lineata*, *Poria pulvinata*, *Auricularia mollis*, *Camillea Zenkeri*, and *Xylaria Cornu Dorcas*, Africa; *Glaziella Berkeleyi*, "Nicobar Island."—The frontispiece to the plates has a photograph of A. D. Cotton of Kew.—L. O. Overholts.

2714. McLEAN, R. C. Remarks on the nature and definition of species. Trans. British Mycol. Soc. 9: 47–58. 1923.—The argument against the present method of systematic mycology, especially against its morphological basis, is based on the charge that the "species" are not

homogeneous units. Analysis of the matter shows that in nature no ideal unit of absolute value exists; to accept such an ideal unit would remove the species from the environment and give it absolute entity within itself. The assumption of an unalterable physiological constitution as a species basis can not be proved as no experiments can demonstrate conclusively that no environmental factor could alter it. "That which is inherited is not form but habit," which can never attain infinite fixity. So, an organism can not be changed by its environment to such an extent that it will not return to its original form. The morphological species of the present systematist are highly constant in many cases, a fact supporting the morphological concept. "Whether a group of individuals be big or little, diagnosed by a syndrome of characters or by a single one; the term species is rightly applied to it if it remains visibly constant under constant conditions." The final analysis of these groups into their constituent elements is outside the limits of practical systematic lines and need not change the present method.—O. K. Stark.

2715. MAGNIN, A. Herborisation mycologique au Grand-Colombier-du-Bougey (Ain). [Mycological collections from Grand-Colombier-du-Bougey.] Bull. Trimest. Soc. Mycol. France 39: 84-86. 1923.—This paper contains the results of a mycological excursion and records a list of fungi, chiefly Hymenomycetes, collected at 800-1,500 m.—S. Blumer.

2716. MAGNIN, A. Présentation de deux monstruosités de champignons. [Two monstruosités of fungi.] Bull. Trimest. Soc. Mycol. France 39: 59-61. Pl. 4, fig. 1. 1923.—The writer described abnormal development in *Mycena polygramma*, grown in a subterranean grotto, and *Clitocybe cryptarum* Letell., grown in a cellar at Besançon.—S. Blumer.

2717. MAUBLANC, A. Rapport sur la session générale organisée en octobre 1922, aux environs de Lyon. [Report on the general session organized in Oct. 1922 in the environs of Lyon.] Bull. Trimest. Soc. Mycol. France 39: 22. 1923.—This paper contains besides the reports of the sessions a list of the collected fungi.—S. Blumer.

2718. МУРАШКИНСКИЙ, К. Е. [MURASHKINSKI, K. E.] Physalosporina Halimodendroni—Возбудитель болезни чингила [Physalosporina Halimodendroni as the cause of mycosis of "chingil."] Научный Сборник Сибирского Института Сельского Хозяйства [Sci. Contrib. Siberian Inst. Agric. [Omsk]] 1. 8 p., 1 pl. 1922.—*Physalosporina Halimodendroni* is described as new. The genus is a stromatic homologue of *Physalospora*.—B. Kozot-Poljanski.

2719. OVERHOLTS, L. O. Diagnoses of American Porias—II. Bull. Torrey Bot. Club 50: 245-253. Pl. 13-14, 3 fig. 1923.—*Poria corticola* (Fr.) Cooke, *P. inermis* E. & E., and *P. medulla-panis* (Pers.) Cooke are redescribed and discussed in detail.—P. A. Munz.

2720. PATOILLARD, N. Herborisations au Cambodge. [Collections from Cambodia.] Bull. Trimest. Soc. Mycol. France 39: 46-58. Pl. 4-5, fig. 1. 1923.—A list of fungi, collected by M. Petelot in 1921, is given (95 Basidiomycetes, 28 Ascomycetes, and 9 Myxomycetes). The following forms are described as new: *Uredo Peteloti*, *Sebacina circumdata*, *Thelephora lactea*, *Cyphella (Solenia) carnea*, *Leucoporus chaetoloma*, *Xanthochrous stupparius*, *Ganoderma (Amauroderma) pallens*, *Caldesiella fragilissima* (Berk. and Curt.) var. *cambodgiana*, *Porolaschia bicolor*, *Dendrogaster cambodgensis*, *Lophodermium Diospyri*, *Anthostomella albocincta*, *Xylaria Lhermii*, and *Nectria sepulta*.—S. Blumer.

2721. PETCH, T. Studies in entomogenous fungi. III. *Torrubiella*. Trans. British Mycol. Soc. 9: 108-128. Pl. 2 (col.), fig. 1-5. 1923.—The genus *Torrubiella* is closely related to *Cordyceps*, differing from that genus in having the perithecia borne on a weft of hyphae instead of embedded in a fleshy stroma. Nine entomogenous species are discussed, 7 of which occur on scale insects. *T. flava*, which occurs on spiders, is described as new.—W. B. McDougall.

2722. PETCH, T. The genus *Trichosterigma* Petch. Trans. British Mycol. Soc. 9: 93-94. 1923.—*Trichosterigma* Petch is synonymous with *Hirsutella* Pat. The species of *Hirsutella* are imperfect stages of *Cordyceps* or related genera.—W. B. McDougall.

2723. PEYRONEL, M. B. Fructification de l'endophyte à arbuscules et à vesicules des mycorhizes endotrophes. [The fructification of mycorrhizal fungi.] Bull. Soc. Mycol. France 39: 119-126. Fig. 1-3. 1923.—The author distinguishes 2 types of endophytic mycorrhizae. One forms ciliate or vesiculate haustoria; the other, that of the Orchidaceae, forms closely packed knots of mycelium. In the cortical layers of a great number of plants, not as deeply

situated as the principal endophyte, a distinct fungus often superimposes itself, corresponding perfectly to the endophytes of the Orchidaceae, producing ciliated processes and vesicles. The 2 endophytes are intimately intermingled,—sometimes existing in the same cell. The author has isolated and grown in pure culture the endophyte of the type found in the Orchidaceae from the mycorrhizae of different plants [*Triticum*, *Zea*, *Hordeum*, *Solanum*, *Nicotiana*, *Daucus*, *Beta*, *Vitis*, *Arum*, *Euphorbia*, *Circaea*, *Saxifraga*]; probably it is a Rhizoctonia. With the Rhizoctonia isolated from the mycorrhizae of wheat the author successfully inoculated young sterile plants and this fungus behaved somewhat like the endophyte in orchid roots. The culture of the endophyte with ciliated processes and vesicles has so far failed to grow. This fungus also lives saprophytically on dead roots and other organic matter in the soil. In autumn and winter, especially following periods of rain, many divided vesicles are found and beside them are ellipsoidal, lemon-shaped spores, hyaline, with well differentiated membrane. It is evident that these spores belong to the endophytic fungus. The vesicles were recognized as the sporangia of a fungus. As to taxonomic relationships, the author believes that the endophyte of the mycorrhizae belongs to the Phycomycetes or to *Endogone*. Probably the mycorrhiza does not consist of a single species, but of many morphological or biological forms of a single species or of a small number of related species.—*S. Blumer*.

2724. REA, CARLETON. **Edible fungi.** Trans. British Mycol. Soc. 9: 35-43. 1923.—*Amanitopsis vaginata* is recommended as a delicious esculent. Of the larger Lepiotes those in which the flesh reddens on exposure to the air are considered better flavored than the others. All edible fungi should be cooked in an earthen casserole having a lid, with plenty of butter or other fat and some salt and pepper. Some species like *Amanitopsis vaginata* require only 10-15 minutes cooking while others, as *Marasmius oreades*, require over 5 hours. Discomycetes should never be eaten raw and the liquid in which they are cooked should be rejected.—*W. B. McDougall*.

2725. RIDLER, W. F. F. **The fungus present in *Lunularia cruciata* (L.) Dum.** Trans. British Mycol. Soc. 9: 82-92. Fig. 1-6. 1923.—A species of *Phoma* has been isolated from the thallus of *Lunularia* but it is not yet certain that this is the true endophyte. The endophytic fungus is considered a rather harmless parasite on the liverwort. The hyphae of the fungus undergo partial digestion by the cells of the liverwort to the extent that its growth and distribution in the thallus is restricted; but there is no conclusive evidence that the liverwort derives any benefit from the presence of the fungus.—*W. B. McDougall*.

2726. ROSENHEIM, O. ***Amanita muscaria* on Hampstead Heath.** Nature 112: 622. 1923.—A specimen collected near London is reported. The rarity of this fungus in the region is probably due to its attractive color and, being poisonous, consequent destruction.—*O. A. Stevens*.

2727. SEAVER, FRED J. **Studies in tropical Ascomycetes-II. An interesting *Xylaria* from Porto Rico.** Bull. Torrey Bot. Club 50: 307-310. Pl. 18. 1923.—*Xylaria Brunneriana* is described as a new species.—*P. A. Munz*.

2728. SMITH, J. HENDERSON. **On the apical growth of fungal hyphae.** Ann. Botany 37: 341-343. 1923.—The author used *Fusarium* sp. and *Pyronema confluens*, and found that no appreciable elongation occurred in any part of the hypha other than the tip. All growth in length was purely apical.—*Margaret Newton*.

2729. STONE, R. E. **The most important poisonous mushrooms.** Sci. Agric. 4: 55-57. 1923.—This is a popular article giving descriptions of *Amanita phalloides*, *A. verna*, *A. muscaria*, and *A. frostiana*. Mention is made of *Russula emetica* and *Lactarius piperatus*. Rules for the guidance of mushroom gatherers are also given.—*T. G. Major*.

2730. WAKEFIELD, E. M. **Fungi exotici, xxvi.** Kew Bull. 1922: 151-165. 8 fig. 1922.—The following species are characterized as new: *Ganoderma simulans*, *Hexagonia sericata*, *Sebacina alutacea*, *Ustilago verruculosa*, *Uromyces pustulatus*, *Mycosphaerella Tristaniae*, *Diaporthe (Chorostate) curvatispora*, *Phyllachora Proteae*, *Hendersonia Osterosperma*, and *Colletotrichum Pterocelastris*. The 1st 2, the 4th and the 5th are from tropical Africa, the 3rd and 7th from India, the 6th from the Federated Malay States, and the last 3 from South Africa.—*T. J. Fitzpatrick*.

2731. [WAKEFIELD, E. M.] Keswick foray. Trans. British Mycol. Soc. 9: 4-10. 1923.—The Autumn Foray and Annual General Meeting, held at Keswick Sept. 15-21, 1922, is reported and a complete list of the fungi collected, about 420 species, is given.—*W. B. McDougall*.

2732. [WAKEFIELD, E. M.] Norwich foray. Trans. British Mycol. Soc. 9: 1-4. 1923.—The Spring Foray, held at Norwich June 2-5, 1922, is reported and a complete list of the fungi collected, about 128 species, is given.—*W. B. McDougall*.

2733. WESTON, WILLIAM H. JR. The water mould *Thraustotheca* found in Formosa. Ann. Botany 37: 347-348. 1923.—In 1917 the writer listed the only recorded findings of *Thraustotheca*. Since then he has encountered a Japanese article, "Paddy Seedling Decay in Formosa," by Kaneyoshi Sawada, published in 1912. Although Sawada's account of *Thraustotheca* is merely a 1-page note incidental to his more intensive study of *Achlya prolifera*, it is none the less of interest to mycologists as the 1st report of this rare fungus from the Orient.—*Margaret Newton*.

LICHENS

2734. CORRINGTON, LEAFY J. The Peltigeraceae. (The Ascomycetes of Ohio V.) Ohio Biol. Surv. Bull. 10: 354-359. Pl. 14, fig. 1-8. 1921.—Characters of the family are discussed, after which are given keys for determination of the species. The genera are *Peltigera* and *Nephroma*. Seven species of the 1st genus and 1 of the 2nd are described from Ohio.—*Bruce Fink*.

2735. FINK, BRUCE. The Lecideaceae. (The Ascomycetes of Ohio IV.) Ohio Biol. Surv. Bull. 10: 334-352. Pl. 13, fig. 1-13. 1921.—Characters of the family are followed by keys and descriptions of species from 7 genera. Two species of *Biatorella*, 12 of *Lecidea*, 4 of *Biatorina*, 6 of *Bilimbia*, 7 of *Bacidia*, 3 of *Buellia*, and 3 of *Rhizocarpon* comprise the 37 species known in Ohio. *Lecidea intropallida*, *Bacidia egenuloidea*, *Buellia turgescens*, and *Rhizocarpon vernicomoides* are described as new species.—*Bruce Fink*.

2736. HOLMES, E. M. Lichens in the British Isles. Pharm. Jour. 110: 66. 1923.—The author presents a summary of the study of lichens of the British Isles since the 16th century when only 6 species had been described from Britain. He particularly mentions the many well-known pharmacists who have had a part in the discovery and description of the numerous lichens now known in Great Britain. He refers to the splendid collections of lichens at Kew Herbarium, Natural History Museum at South Kensington, in the herbaria of the University of Edinburgh and Glasgow, and of Trinity College, Dublin. Reference is also made to the unique collection formed by the author, at University College, Nottingham, in which the specimens are arranged in boxes so that they retain their natural appearance without pressure or rubbing and are in alphabetical order generically and specifically so as to be as easy of reference as a dictionary.—*E. N. Gathercoal*.

2737. KNIGHT, H. H. Keswick lichens. Trans. British Mycol. Soc. 9: 10-12. 1922.—This complete list of the lichens collected during the Keswick foray in September, 1922, contains about 145 species.—*W. B. McDougall*.

2738. MALME, GUST. O. AN. Die Flechten der ersten Regnellischen Expedition. Die Gattungen Bombyliospora, Megalospora, Catillaria und Rhizocarpon. [The lichens of the first Regnellian expedition. The genera Bombyliospora, Megalospora, Catillaria, and Rhizocarpon]. Ark. för Bot. 18: 1-17. 1923.—The following new species and subspecies are given: *Megalospora dimota*, *Catillaria chalybaeoides*, *C. irrorata*, *C. depauperata*, *C. (Micarea) americana*, *C. (Micarea) itacolumitica*, and *Rhizocarpon obscuratum* (Ach.) Massal. subsp. *megapotamicum*.—*O. Heilborn*.

BACTERIA

2739. BERGEY, D. H. Difficulties encountered in the classification of bacteria. [Abstract.] Absts. Bact. 7: 276. 1923.—The generic name *Bacterium* has been dropped and the various sub-genera raised to generic rank. The name *Pseudomonas* may have to be treated similarly.—*D. Reddick*.

2740. BUCHNER, PAUL. Über ein neues, symbiotisches Organ der Bettwanze. [Concerning a new symbiotic organ in the bedbug.] Biol. Centralbl. 41: 570-574. 1921.—Previous researches of the author have resulted in the discovery and description of certain symbiotic

bodies in Pediculids which are regarded as bacterioids (see P. BUCHNER, Über Rassen- und Bacteroidenbildung bei Insectensymbionten. Biol. Centralbl. 42: 1921). Shandinn's (1904) researches on the yeast-like organisms found in certain culdesacs of the alimentary tract of species of *Culex* and *Anopheles* showed that in the act of sucking these microorganisms are discharged into the wound and cause the swellings which result from the bite of these insects. Buchner suggests the likelihood that in all cases of blood sucking insects where swellings result the swelling is due to enzymes of symbiotic microorganisms. As a further test of the correctness of this supposition the author has made a study of the common house bug (*Acanthia lectularis*). Both sexes of this insect are found to possess a paired mycetome, an organ with the sole function of harboring symbiotic bacteria. These mycetomes are oval bodies lying in the 3rd abdominal segment, laterally from the alimentary tract and in the vicinity of the sex organs. By a study of egg formation and stages in the embryology of *Acanthia* the complete cycle of the symbiont has been traced and the mode of its transmission to the egg from the mycetome of the adult determined together with the subsequent development of the symbiont in the embryonic stages of the insect. As experimentally shown by Shandinn in *Culex* symbionts, the author by transferring the mycetome of *Acanthia* to the blood exudate from a sterilized needle prick in the skin and slightly rubbing the wound was able to produce swellings identical with those caused by the insect bite.—W. L. Bray.

2741. GIBBS, CHARLES S. The role of bacteria in nature. China Jour. Sci and Arts 1: 366-371. 1923.

2742. HEINEMAN, P. G. Orla-Jensen's classification of lactic acid bacteria. [Rev. of: ORLA-JENSEN, SIGURD. Maelkeribakteriologi. [Milk bacteriology.] Mem. Acad. R. Sci. et Lettres Danemark 5: 81-196 1919.] Jour. Dairy Sci. 3: 143-155. 1920.—Results of cultural and biochemical reactions have here been used as a basis for classification. The method of investigation included, among others, the following points: morphology and cultural features, sources of energy, nutritive material utilized and the manner of utilization, temperature relations, and agglutination. As a result of his studies Orla-Jensen recognizes the following genera: *Streptococcus*, *Betacoccus*, *Tetracoccus*, *Thermobacterium*, *Streptobacterium*, *Betabacterium*, *Microbacterium*, *Bacterium bifidum*. The morphology of the types studied is illustrated by 280 photo-micrographs and several reproductions of gelatin cultures. Orla-Jensen's work marks progress in our knowledge of lactic acid bacteria and confirms and amplifies recent work. Former classifications based on morphology are shown to be incomplete. The author states that the composition of the medium is of great importance for the study of bacterial products. The need of uniform culture media in bacteriological work is becoming more apparent.—D. S. Welch.

MYXOMYCETES

2743. ALEXANDER, P. J. Ecology and phenology of Surrey mycetoza. Trans. British Mycol. Soc. 9: 58-77. 1923.—Notes on 128 species and 19 varieties are included. The notes consist essentially of records of dates and habitats for collections of the various species.—W. B. McDougall.

2744. CHEESEMAN, W. N., AND W. T. ELLIOTT. Report on the mycetoza found during the foray at Keswick. Trans. British Mycol. Soc. 9: 12-14. 1923.—A list of 30 species is given together with some notes on habitats.—W. B. McDougall.

2745. FULMER, E. L. The slime molds of Ohio. Ohio Biol. Surv. Bull. 11: 1-72. Pl. 1-10. 1921.—About 150 species of slime molds are known for Ohio. As the general characters of the group are partly plant and partly animal, it seemed best not to place the slime molds definitely in either group. There is a brief characterization of the organisms treated (the Myxophyta), after which appears a key to classes, orders, and families. The remainder of the paper consists of technical descriptions of classes, orders, families, genera, and species. Keys to genera and species accompany this portion of the paper. The species are: 1 of the genus *Plasmodiophora*, 9 of *Badhamia*, 3 of *Fuligo*, 31 of *Physarum*, 1 of *Physarella*, 5 of *Craterium*, 1 of *Cienkowskia*, 1 of *Leocarpus*, 7 of *Diderma*, 2 of *Diachaea*, 1 of *Lepidoderma*, 1 of *Mucilago*, 9 of *Didymium*, 6 of *Stemonitis*, 6 of *Comatrichia*, 1 of *Enerthenema*, 5 of *Lamproderma*, 1 of *Clastoderma*, 1 of *Amaurochaete*, 1 of *Brefeldia*, 3 of *Licea*, 1 of *Orcadella*, 1 of *Dictydium*,

11 of *Cribraria*, 1 of *Lindbladia*, 3 of *Tubifera*, 1 of *Dictydiaethalium*, 1 of *Reticularia*, 1 of *Enteridium*, 3 of *Lycogala*, 8 of *Arcyria*, 2 of *Perichaena*, 2 of *Ophiotheca*, 1 of *Lachnobolus*, 1 of *Calonema*, 7 of *Hemitrichia*, 2 of *Oligonema*, and 8 of *Trichia*. None of the species is new.—Bruce Fink.

2746. LISTER, G. *Lamproderma columbinum* Rost. and its varieties. Trans. British Mycol Soc. 9: 32-34. 1923.—Two varieties of *Lamproderma columbinum*, namely *brevipes* and *iridescens*, are recognized as new and described.—W. B. McDougall.

2747. SIEMASZKO, WINCENTY. O nowym słuzowcu z Kaukazu *Lycogala Rostafinskii* nov. sp. [A new myxomycete *Lycogala Rostafinskii* n. sp., from Caucasus.] Kosmos 47: 244-250. Pl. 5. 1922.—The species was found in the forest near Souchoum on the dead trunk of a beech (*Fagus orientalis* Lipsky).—D. S. Welch.

PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

(See also in this issue Entries 2351, 2356, 2366, 3157)

2748. АЛЕХИН, В. В. [ALEKHIN, V. V.] Третичная и послетретичная флора южной России (обзор по литературным данным). [The tertiary and post tertiary floras of South Russia (review of the literature).] Журнал Московского Отделения Русского Ботанического Общества. [Jour. Moscow Sect. Russ. Bot. Soc.] 1: 58-63. 1922 [1923].

2749. JOLEAUD, L. *Éléments de paléontologie*. [Elements of paleontology.] 220 p., 53 fig. Collection Armand Colin: Paris, 1923?

2750. KNOWLTON, F. H. The Laramie flora of the Denver Basin with a review of the Laramie problem. U. S. Geol. Survey Professional Paper 130. 175 p., 28 pl. 1922.—The conditions which gave rise to the use of the term Laramie, from F. V. Hayden's explorations in the Missouri River region, 1854-1875, when the term was 1st published, are recited. Then followed the period when the Laramie was believed to cover a vast area, extending from northern Mexico to the Arctic circle and many hundreds of miles wide. In the present conservative application, "Laramie is considered as a formational term, and the Laramie formation is defined in accordance with the original definition of King, namely, as the uppermost member of the conformable Cretaceous series above the Fox Hills." Although no type locality is intended for the term, the Laramie is applied to northwestern Colorado and parts of the Laramie Plains, mainly of eastern Wyoming.—Practically the entire Denver Basin is presumably underlain by the Laramie. It is the youngest Cretaceous formation in the Colorado Front Range region, rests conformably on the Fox Hills sandstone, from which it is distinguished by the lighter color of the outcrops and the presence of numerous marine invertebrates in the topmost layer of the Fox Hills, and ranges in thickness between 600-1,200 feet. No vertebrates are found. There are present several species of invertebrates, and small amounts of amber. The flora of the Laramie in the Denver Basin comprises 129 forms, 78 described as new as follows: *Dryopteris georgei*, *D.?* *carbonensis*, *Phanerophlebitis pealei*, *Asplenium martini*, *Pteris goldmani*, *Cyperacites?* *hillsii*, *C.?* *tessellatus*, *Smilax?* *inquirenda*, *Sabal montana*, *Juglans leydenianus*, *J. newberryi*, *J. laramiensis*, *J. praerugosa*, *Hicoria angulata*, *H. minutula*, *Myrica dubia*, *M. oblongifolia*, *Salix myricoides*, *S. brittioneana*, *Populus?* *distorta*, *Quercus praeangustiloba*, *Q. eximia*, *Artocarpus liriodendroides*, *Ficus pealei*, *F. praeplanicostata*, *F. impressa*, *F. neodalmatica*, *F.?* *leyden*, *F. posttrinervis*, *F. cannoni*, *F. cowanensis*, *F. berryana*, *F.?* *apiculatus*, *Aristolochia brittoni*, *Magnolia marshalli*, *M. lakesii*, *Anona coloradensis*, *Laurus lanceolata*, *L. lakesii*, *Malapoenna louisvillensis*, *Cinnamomum laramiense*, *Leguminosites?* *coloradensis*, *L. columbianus*, *L. laramiensis*, *Mimosites marshallensis*, *Cassia?* *laramiensis*, *Celastrinites alatus*, *C. eriensis*, *C. cowanensis*, *Negundo brittoni*, *Pistacia eriensis*, *P. hollicki*, *Ilex laramiensis*, *Ceanothus eriensis*, *C. ovatifolius*, *Rhamnus minutus*, *R. marshallensis*, *R. brittoni*, *R.?* *pealei*, *Zizyphus coloradensis*, *Z. hendersoni*, *Z. corrugatus*, *Z. minutus*, *Apeibopsis?* *laramiensis*, *Cornus praeimpressa*, *Hedera lucens*, *Diospyros berryana*, *Fraxinus?* *princetoniana*, *Apocynophyllum taenifolium*, *Dombeyopsis?* *sinuata*, *D. ovata*, *Carpites lakesii*, *C. lesquereuxiana*, *Phyllites leydenianus*, *P. marshallensis*, *P. trinervis*, *P. dombeyopsoides*, *Palaeoaster?* *similis*.—Rose Meyrowitz.

2751. Козо-Полянский, В. М. [Kozot-Poljanski, B. M.] Симбиогенезис в эволюции растительного мира. [Symbiogenesis in the evolution of the plant world.] Вестн. Опытно. Дела Средне-Черноз. Обл. [Bull. Exper. Inst. Middle Chërnózemnaya Region.] 4. 24 p. 1921.

2752. Козо-Полянский, В. М. [Kozot-Poljanski, B. M.] Теория симбиогенезиса и "пангенезис, временная гипотеза." [Theory of symbiogenesis and "pangenesis, a temporary hypothesis."] Дневник I. Всероссийского Съезда Ботаников [Jour. I. All-Russian Congress of Botanists] 5: 111. 1921 [1922].

2753. KUBART, B. Was ist *Spondylostrobus Smythii* F. v. Mueller? [What is *Spondylostrobus Smythii* Mueller?] Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) 131: 313-325. Pl. 1, fig. 3. 1922.—The wood from the Pliocene of the auriferous drifts of south Australia which von Mueller associated with the fossil cones described under the above name is restudied and found to resemble that of *Dacrydium* and *Podocarpus*. It is renamed *Podocarporoxylon Smythii*.—E. W. Berry.

2754. KUBART, BRUNO, UND ROBT. SCHWINNER. Interglaziale Schieferkohlen von der oberen Gail (Sw-Kärnten). [Interglacial bedded coal from the upper Gail valley in Carinthia.] Österreich. Bot. Zeitschr. 1923: 305-321. 1923.—The writers describe the occurrence of coal in the Gail valley in southwestern Carinthia and give a detailed account of the fossil wood it contains. The wood is minutely compared with that of *Larix*, *Picea*, and *Pseudotsuga*, and the conclusion is reached that it represents *Picea*, possibly of more than a single species.—E. W. Berry.

2755. MORELLET, L., ET J. MORELLET. Contribution a l'étude paléontologique du genre *Halimeda* Lamx. (Algue Siphonée de la famille des Codiacees). [Contribution to the study of the genus *Halimeda* of the family Codiaceae.] Bull. Soc. Géol. France 22: 291-296. Pl. 11-12, fig. 2. 1922.—The authors discuss the general characters of *Halimeda* and describe 3 different fossil forms,—unnamed species from an undetermined Tertiary horizon in Italy (Gangliano) and from the Auversian or middle Eocene of France,—and *Halimeda praeopuntia* n.sp. from the Oligocene (Stampian) of Gaas.—E. W. Berry.

2756. SCOTT, D. H. The origin of the seed plants (Spermatophyta). Genetica 5: 51-60. 1923.—The common view, once strongly championed by the author, that seed plants, beginning with fossil Pteridosperms (Cycadofilicales), originated from ferns, is now strongly refuted by the same author. At present the best available evidence indicates clearly that seed plants "constitute an independent phylum, of equal antiquity with any of the recognized lines of vascular cryptogams." The actual origin of seed plants is uncertain but the event took place much earlier than has been generally supposed.—Merle C. Coulter.

PATHOLOGY

FREDERICK V. RAND, *Editor*
LILLIAN C. CASH, *Assistant Editor*
HARRY BRAUN, *Assistant Editor*

(See also in this issue Entries 2168, 2180, 2211, 2250, 2265, 2266, 2301, 2424, 2427, 2434, 2438, 2447, 2476, 2496, 2497, 2499, 2501, 2506, 2509, 2514, 2524, 2525, 2529, 2531, 2534, 2535, 2537, 2539, 2549, 2566, 2571, 2573, 2580, 2581, 2596, 2606, 2684, 2688, 2694, 2695, 2696, 2705, 2707, 2725, 2740, 2938, 3086, 3128, 3206)

DISEASES CAUSED BY FUNGI

2757. ANONYMOUS. Corky or powdery scab (*Spongospora subterranea*). Cyprus Agric. Jour. 18: 77-78. 1923.—The author gives a popular description of the disease and of the control measures that may be employed. No mention is made of its occurrence in Cyprus.—W. Stuart.

2758. ANONYMOUS. Fruit tree diseases and their treatment. An apple tree canker. South African Fruit Grower 10: 65. 4 fig. 1923.—This disease (*Botryosphaeria Mali* Putterill) causes rotting of the fruit. It is probably widely distributed throughout the country.—L. J. Goldblatt.

2759. ANONYMOUS. Fruit tree diseases and their treatment. Anthracnose of citrus fruits; blue mould of citrus fruits. South African Fruit Grower 10: 177-179. 3 fig. 1923.—Spraying has proved effective in keeping anthracnose (*Colletotrichum gloeosporioides* Penzig) in check.—The chief causes of wastage in South African oranges are the mould fungi, *Penicillium digitatum* (Fr.) Sacc. and *P. italicum* Wehmer.—L. J. Goldblatt.

2760. ANONYMOUS. Fruit tree diseases and their treatment. Scab or Fusicladium of the apple; powdery mildew of the apple. South African Fruit Grower 9: 325-327. 3 fig. 1923.—Descriptions and control methods are given for apple scab (*Venturia inaequalis* Cooke) and powdery mildew (*Podosphaera leucotricha* (E. & E.) Salm.)—L. J. Goldblatt.

2761. ANONYMOUS. Fruit tree diseases and their treatment. Scab or Fusicladium of the loquat and leaf blight of the loquat. South African Fruit Grower 9: 359. 7 fig. 1922.—The former disease is caused by *Fusicladium* sp. and the latter by *Entomosporium* sp. Characteristics of these diseases and methods of control are discussed.—L. J. Goldblatt.

2762. ANONYMOUS. Fruit tree diseases and their treatment. Scab or Fusicladium of the pear. South African Fruit Grower 9: 271-273. 8 fig. 1922.—The characteristics and control methods of this disease (*Venturia pirina*) are discussed. Failure to spray, or spraying at the wrong time, may result in a total loss of the crop.—L. J. Goldblatt.

2763. ANONYMOUS. Fruit tree diseases and their treatment. Silver leaf disease of fruit trees. South African Fruit Grower 10: 259, 261. 5 fig. 1923.—There are no regulations governing this disease (*Stereum purpureum* Pers.) in force in South Africa.—L. J. Goldblatt.

2764. ANONYMOUS. Trials of potatoes for immunity from wart disease, 1922. Jour. Ministry Agric. Great Britain 29: 1134-1138. 1923.—Further trials, in 1922, have added the following varieties to the list of those approved as immune: Millar's Beauty, Marquis of Bute, Ben Lomond, Ben Ledi, Ben Cruachan, Utility, Golden Las, International Kidney, and Clifden Seedling.—M. B. McKay.

2765. BAUDYŠ, E. K sněživosti pšenice a ječmenů. [Wheat and barley smuts.] Moravský Hospodář 1922: 31-33. 1922.—The recent unusual spread of wheat and barley smuts is probably due to the poor cultivation, poor seed, and high cost of seed treatment prevailing during the war. Directions for the customary hot water and formalin treatments are given. A variety may differ in susceptibility to hot water injury from year to year and requires annual determinations of the proper temperatures. The germination of old seed is improved by formalin treatment. Smut spores, which do not survive at temperatures above 35°C., can not retain their vitality in dung-heaps, since the temperature reaches 60-70°C.—E. Baudyš.

2766. BENSAUDE, MATHILDE. A species of *Olpidium* parasitic in the roots of tomato, tobacco, and cabbage. Phytopathology 13: 451-454. 5 fig. 1923.—A species of *Olpidium* was found infesting the roots of tomato [*Lycopersicum esculentum*], tobacco [*Nicotiana* sp.], and cabbage [*Brassica oleracea*] in a greenhouse at Madison, Wisconsin. The organism seemed identical with *Olpidium Brassicae* (Wor.) Dangeard; but it did not produce the serious injury to infested plants attributed to this species by various authors.—B. B. Higgins.

2767. BOYLE, L. W. Fusarium rot of onions. [Abstract.] Phytopathology 13: 510. 1923.

2768. BUCHTA, VIKTOR. Hubami zapříčinené niektoré nemoce zelenín a ako sa máme chrániť proti nim. [Some fungus diseases of vegetables and how to control them.] Ochrana Rostlin 2: 23-24. 1922.—Diseases caused by the following fungi are named: *Plasmodiophora Brassicae*, *Pseudoperonospora cubensis*, *Peronospora parasitica*, *Bremia Lactucae*, *Peronospora effusa*, *P. Viciae*, *P. Schleideniana*, *P. Polygoni*, *Puccinia Asparagi*, *Ascochyta Pisi*, *Erysiphe communis umbelliferarum*, *Sphaerotheca Castagnei*, *Oidium Fragariae*, *Gloeosporium lindemuthianum*, *Sclerotinia libertiana* on vegetables, and *Phoma sanguinolenta* on carrot.—E. Baudyš.

2769. CHABROLIN, C. Traitements contre la cloque du pêcher (*Exoascus deformans*) dans la vallée du Rhône. [Spraying for peach leaf curl in the Rhone valley.] Rev. Path. Vég. et Entomol. Agric. 10: 194-201. 1923.—Spraying with strong alkaline Bordeaux mixture (CuSO_4 , 3 kgm.; $\text{Ca}(\text{OH})_2$, 4 kgm.; casein, about 50 gm.; water, 100 l.) is advocated at the beginning of winter as being efficient against both *Exoascus deformans* and *Coryneum (Clas-terosporium carpophilum)*.—J. Dufrenoy.

2770. COOK, MEL. T. A greenhouse disease of melons. Phytopathology 13: 462-463. 1923.—A streak disease of muskmelon stems is probably due to a species of *Fusarium*.—B. B. Higgins.

2771. COOK, MEL. T. **Brown rot of apple.** *Phytopathology* 13: 462. 1923.—A decay of winesap apples due to species of *Botrytis* and *Sclerotinia* is noted.—*B. B. Higgins.*

2772. CRAWFORD, R. F. **Fungi isolated from the interior of cotton seed.** *Phytopathology* 13: 501-503. 1923.—Cotton seed were delinted with strong H_2SO_4 , dried, and stored. Later they were again charred with H_2SO_4 , treated 2 minutes in a 1-1,000 solution of $HgCl_2$, and planted on sterile, moist filter paper in Petri dishes. The fungi isolated included *Fusarium vasinfectum*, *Diplodia Gossypii*, *Colletotrichum* sp., and 3 unidentified species of *Fusarium*.—*B. B. Higgins.*

2773. DANA, B. F. **Botrytis diseases in Washington.** [Abstract.] *Phytopathology* 13: 509. 1923.

2774. DANA, B. F. **Notes on Rhizoctonia.** [Abstract.] *Phytopathology* 13: 509. 1923.—Data are given on control of *Rhizoctonia* on Irish potatoes.—*B. B. Higgins.*

2775. DICKSON, B. T., R. SUMMERBY, and J. G. COULSON. **Experiments in the control of oat smut.** *Ann. Rept. Quebec Soc. Protection of Plants* 15: 102-105. 1922-1923.—Banner Dery and Hull-less 709 M. C. oats were used with the loose smut pathogen [*Ustilago Avenae*]. Check plots of Hull-less oats developed an average of 49% smut, copper carbonate dust treatment 0.3%, copper sulphate dip, none. Formaldehyde treatments controlled smut but were injurious to germination. With Banner Dery, checks gave 1.5% smut and copper carbonate dust a negligible per cent.—*B. T. Dickson.*

2776. GRAVES, ARTHUR HARMOUNT. **The Melanconis disease of the butternut (*Juglans cinerea* L.)** *Phytopathology* 13: 411-435. *Pl.* 19-20. 5 fig. 1923.—A die-back of the twigs and branches and death of the trees at an early age have been noted by various writers; but the cause of the disease has remained undetermined. The author, observing the association of the conidial fungus *Melanconium oblongum* Berk. with the disease, began experimental study by which the role of this fungus as causal agent of the disease was definitely established. Infection occurs through wounds or dead twigs and the fungus, passing directly into the wood, spreads slowly up and down the branch and finally into the trunk. The tree dies slowly, beginning at the tips of the branches. The leaves turn yellow and drop one by one so that no distinct wilting is evident. Conidial masses soon break through the epidermis of the dead twigs and appear as small black dots. Pure cultures from the conidia reproduced the disease with all attendant symptoms. A perithecial stage was also found, in the bark crevices, which agrees morphologically with herbarium specimens of *Diaporthe Juglandis* E. & E. Cultures obtained from single ascospores produced conidia similar to the *Melanconium* conidia. The fungus is therefore transferred to the genus *Melanconis* and is redescribed as *Melanconis Juglandis* (E. & E.) comb. nov. Reports and collections indicate that the disease extends over the entire range of *Juglans cinerea*. It has also been found on *J. nigra*, *J. regia*, and *J. Sieboldiana*. The latter species is very susceptible.—*B. B. Higgins.*

2777. HEALD, F. D. **The copper carbonate bunt problem.** [Abstract.] *Phytopathology* 13: 511. 1923.

2778. HOCKEY, J. F. **Blue stem of the black raspberry.** *Ann. Rept. Quebec Soc. Protection of Plants* 15: 92-93. 1922-1923.—This is the 1st record of blue stem (*Acrostalagmus caulophagus* Lawr.) in the Niagara district of Ontario. Cultures of the fungus were made.—*B. T. Dickson.*

2779. HORI, SHOTARO. **Leaf spot disease of cereals.** *Imp. Agric. Exp. Sta. Nishigahora Bull.* 14, pt. 1. 134-141, 1 pl. 1899. Translated by D. T. HEMMI. Typewritten copy, U. S. Dept. Agric. Lib., Washington, D. C., 1922.—The author describes symptoms of the stripe disease of barley (due to *Helminthosporium gramineum* Eriks.) occurring on barley and rye. Resistant and susceptible varieties are listed and morphological characters of the causal organism are given. The disease is controlled by soaking the seed 24 hours in wood-ash water.—*Charlotte Elliott.*

2780. HUMPHREY, C. J. **Decay of poles and the fungi which cause it.** *Rept. Special Comm. on Wood Preservation. Amer. Electric Railway Engineering Assoc.* 312. 52-69. 3 pl. *Amer. Elec. Railway Assoc.*: New York, 1923.—Decay is the factor of greatest importance in the deterioration of poles and this decay is due almost exclusively to the growth of wood-destroying fungi within the timber. Molds and bacteria play little part in the primary

disintegration of wood but they may come in as secondary organisms to act on the partially decomposed remains left by the wood-destroyers.—The fundamental requirements for fungus growth are summarized under food supply, moisture, temperature, and air supply.—Decay in poles is discussed from 2 angles: (1) heart or butt rots which have developed in the living tree, and (2) rots which enter after the poles are cut.—Methods of control are then discussed, and finally brief descriptions are given of some 19 species of wood-destroying fungi, in each case including the type of rot and species of trees attacked.—*Frederick V. Rand.*

2781. HUNGERFORD, CHAS. W. A serious disease of wheat caused by *Sclerotium rhizodes* in Idaho. *Phytopathology* 13: 463-464. 1923.—Environmental conditions and symptoms of the disease as it occurred in 1922 are briefly given. Losses in the various fields ranged from a trace to 50%.—*Frederick V. Rand.*

2782. JONES, H. R. B. A wound parasite of cotton bolls. *Minist. Agric. Egypt, Tech. and Sci. Service (Bot. Sect.) Bull.* 19. 8 p., 2 pl. 1923.—This is an account of the fungus *Rhizopus nigricans* as the cause of much damage to cotton bolls. The organism does not affect healthy plants, but enters through wounds caused mainly by the pink bollworm (*Platyedra gossypiella*) and the boll worm, *Earias insulana*. The only effective control seems to lie in checking these insects.—*Frederick V. Rand.*

2783. KHAN, A. HAFIZ. *Polyporus gilvus* (Schw.) Fr. and Pat. A suspected root parasite of shisham (*Dalbergia sissoo*). *Indian Forester* 49: 503-506. 1923.—A number of trees of all ages have recently died from some unknown agency, and *P. gilvus* is suspected. This is the 1st time the disease has been reported on this host in India. Former mortalities have been attributed to *Ganoderma lucidum*. Inoculation experiments are in progress at Dehra Dun.—*E. N. Munns.*

2784. LA RUE, CARL D. *Helminthosporium Heveae* in Sumatra. *Phytopathology* 13: 483-487. 1923.—The occurrence of *Helminthosporium Heveae* Petch on *Hevea brasiliensis* has been observed in Sumatra. It attacks the leaves, petioles, and occasionally the bark of young twigs, often causing severe injury to young nursery stock. Occasionally the leaves of older twigs show considerable spotting. The measurements of spores of the fungus in Sumatra are much smaller than those given by Petch for spores of this species in Ceylon.—*B. B. Higgins.*

2785. MACKIE, WILLIAM W., AND FRED N. BRIGGS. Fungicidal dusts for the control of bunt. *California Agric. Exp. Sta. Bull.* 364. 533-572. 3 pl., 12 fig. 1923.—This paper is based on investigations conducted under cooperative agreement between the U. S. Dept. of Agriculture and the California Agric. Exp. Sta.—The literature on research with dusts and the general question of fungicidal dusts vs. solutions are briefly detailed. The plan of procedure then is followed by a discussion of results with flowers of sulphur, copper sulphate powder, copper carbonate powder, and miscellaneous dusts. The investigation includes tests with copper carbonate as to the effect of varying strengths on bunt control, comparison of effectiveness of different commercial samples, effect on seed germination, stimulation of wheat seedlings, standards of purity and physical fineness, suggested qualities for a standard, machines for applying, effect of the dust on operators, sources of copper carbonate, and demonstrations on farms.—Copper carbonate dust, 2 ounces or more to the bushel, effectively controlled bunt on wheat when the seed was not blackened with spores. Bluestone and formaldehyde solutions were more effective for heavily bunted seed, but are liable to cause severe seed injury. Copper carbonate-treated seed is not injured even when stored for some time before planting. Use of a dust mask protects the operator, and effective dusting machinery is being rapidly developed.—All seed wheat should be treated since small quantities of spores may cause extensive infection.—*Frederick V. Rand.*

2786. MAJOR, T. G. Cultural characteristics of certain species of *Fusarium*. *Ann. Rept. Quebec Soc. Protection of Plants* 15: 79-88. 1922-1923.—A brief résumé is given of growth characters of 7 *Fusarium* species on various media, and the effects of temperature and of different pH values.—A bibliography of 17 entries is added.—*B. T. Dickson.*

2787. MALENÇON, M. Sur un cas de parasitisme de *Panus conchatus* Bull. [A case of parasitism of *Panus conchatus*.] *Bull. Trimest. Soc. Mycol. France* 39: 153-155. 1 fig. 1923.—*Panus conchatus* was found first on an injured branch of beech, from which it spread to healthy branches of the same tree.—*S. Blumer.*

2788. NOVÁK, STANISLAV. **Padání rostlin.** [Damping off of seedlings.] *Ochrana Rostlin* 2: 7-9. 1922.—This contains a description of the disease and its cause, *Olpidium Brassicae*, for which no control method is known. Similar symptoms may be caused by *Pythium de Baryanum*, *Aphanomyces laevis*, and *Phoma Betae*. Seed treatment at dry heat (55°C.) is recommended. For *Phoma Betae*, seed treatment for 2 hours in 1½% formalin or 4 hours in ½% Uspulum is recommended.—*E. Baudyš.*

2789. PARKER, CHAS. S. **Coryneum blight of stone fruits in Washington.** [Abstract.] *Phytopathology* 13: 510. 1923.—*Coryneum Beijerinckii* Oudem. was demonstrated to be the causal organism.—*Frederick V. Rand.*

2790. PARKER, CHAS. S. **Notes on the anthracnose of lettuce.** [Abstract.] *Phytopathology* 13: 510. 1923.—*Marssonina panattoniana* (Berlese) Magnus on *Lactuca* sp. is reported.—*B. B. Higgins.*

2791. PUTTERILL, V. A. **Silver leaf disease of fruit trees and its occurrence in South Africa.** *Union South Africa Dept. Agric. Sci. Bull.* 27. 19 p., 10 fig. 1923.—The author describes 2 types of silver leaf disease, "false silver leaf" and "true silver leaf." The former is due to physiological causes; the latter is caused by *Stereum purpureum*, which enters the tree through wounds and attacks the living wood. *S. purpureum* was isolated from trees typically silvered and inoculations with this fungus in the fall resulted in marked silvering of the young foliage the following spring. Control measures recommended consist in protecting all wounds by tarring, and cutting out and immediately burning diseased wood.—*V. A. Putterill.*

2792. PUTTERILL, V. A. **The biology of Schizophyllum commune Fries with special reference to its parasitism.** *Union South Africa. Dept. Agric. Sci. Bull.* 25. 35 p., 5 pl., 5 fig. 1922.—Inoculations were carried out with *Schizophyllum commune* on stone-fruit trees with positive results in 12 out of 16 cases. The fungus was subsequently recovered from the discolored wood and must therefore be regarded as parasitic. It makes use primarily of the cellulose constituents of the wood. Cultural characters of the fungus and the production of sporophores on artificial media are described. Tests were also carried out in connection with enzyme production.—*E. M. Doidge.*

2793. ROBERTS, JOHN W. **Apple bitter-rot cankers in the eastern United States.** *Phytopathology* 13: 461. 1923.—Two bitter-rot (*Glomerella cingulata*) cankers were recently collected by Errett Wallace near Cornelia, Georgia. This appears to be the 1st report of bitter-rot canker from an Atlantic Coast state.—*B. B. Higgins.*

2794. ROBERTS, JOHN W. **Plum blotch.** *Phytopathology* 13: 461-462. 1923.—In 1892 L. H. Bailey (Cornell Agric. Exp. Sta. Bull. 38. p. 95) briefly described a fruit spot of plum which the writer thinks was produced by *Phyllosticta congesta* Heald and Wolf.—*B. B. Higgins.*

2795. SCHMITZ, HENRY. **Phytopathological notes. Leaf cast of Larix occidentalis by Hypodermella laricis Tubeuf in north Idaho.** *Phytopathology* 13: 505-506. 1 fig. 1923.—Attention is called to the serious nature of the disease as it occurs in Idaho.—*B. B. Higgins.*

2796. SCHMITZ, HENRY. **Studies in wood decay. V. Physiological specialization in Fomes pinicola Fr.** [Abstract.] *Phytopathology* 13: 511. 1923.

2797. SOUČEK, KAREL E. **Výsledky pokusů s mořením osiva.** [Results of seed treatment investigations.] *Ochrana Rostlin* 2: 56-58. 1922.—The following results were obtained on $\frac{1}{10}$ -hectare plots with various seed treatments of rye for *Fusarium nivale*: check, 60 kgm. grain, 140 kgm. straw; soaked $\frac{1}{2}$ hour in water, 67 kgm. grain, 148 kgm. straw; Uspulum, 85 kgm. grain, 156 kgm. straw; mercuric chloride, 87 kgm. grain, 196 kgm. straw. The following results were obtained on $\frac{1}{10}$ -hectare plots in treatments of oats for *Ustilago Avenae*: check, 48 kgm. grain, 82 kgm. straw; water $\frac{1}{2}$ hour, 45 kgm. grain, 72 kgm. straw; Uspulum, 49 kgm. grain, 85 kgm. straw; Germisan, 50 kgm. grain, 84 kgm. straw; Fertilisa, 44 kgm. grain, 83 kgm. straw; formalin, 51 kgm. grain, 90 kgm. straw; Koncelts' preparation, 50 kgm. grain, 80 kgm. straw. Formalin is considered best for oat seed treatment.—*E. Baudyš.*

2798. STRAŇÁK, FR. **Československé bramborářství ohroženo invazí rakoviny bramborů z Německa.** [Potato culture in Czechoslovakia is threatened by invasion of potato wart from Germany.] *Ochrana Rostlin* 2: 35-36. 1922.—Potato wart (*Synchytrium endobioticum*) has greatly increased in Germany in recent years and may enter Czechoslovakia. Quarantine of potatoes from Germany and cultivation of resistant varieties are recommended.—*E. Baudyš.*

2799. STRAŇÁK, FR. Moření osiva proti snětivosti strojem "Universum." [Seed treatment for smut with the "Universum" apparatus.] *Ochrana Rostlin* 2: 54-56. 2 fig. 1922.—This apparatus can be used for treatment with hot water or with disinfectants. For the latter the solution is forced into the seed tank through perforations in a false bottom under which is a funnel-shaped container. A force pump is used. For the hot water treatment there is a separate container having walls lined with heat-insulating material, and a heater attached to the bottom.—*E. Baudyš.*

2800. STRAŇÁK, FR. Povážlivé šíření se rakoviny bramborů v československé republice. [The distribution of potato wart in Czechoslovakia.] *Ochrana Rostlin* 2: 51-52. 1922.—This disease is present in the Schluknauer, Rumburger, and Warnsdorfe districts near the German border. Quarantine measures and the planting of resistant varieties are being undertaken.—*E. Baudyš.*

2801. ŠVEC, FR. Desinfekce půdy uspulunem proti hlízotvorce. [Soil disinfection for cabbage club root with Uspulum.] *Ochrana Rostlin* 2: 59-60. 1922.—Cabbage club root was controlled by soaking the ground with $\frac{1}{2}$ per cent solution of Uspulum at the rate of 8 l. per square m. It is considered too expensive for use on a large scale but is recommended for small gardens.—*E. Baudyš.*

2802. ŠVEC, FR. Krytá sněť žitná. [Stem smut of rye.] *Ochrana Rostlin* 2: 49-50. 1922.—During 1922 this disease (caused by *Urocystis occulta*) caused 25% damage. The author recommends treatment with mercuric chloride or formalin at central treating stations.—*E. Baudyš.*

2803. TANAKA, TYÓZABURÓ. A brief history of Citrus scab in Japan. *Phytopathology* 13: 492-495. 1923.—The occurrence of citrus scab in Japan more than 100 years ago is evident from descriptions and illustrations of oranges grown at that time. Early writers considered the scabby fruit as a distinguishing character of certain varieties. During the present century the disease in Japan has been attributed by some authors to *Cladosporium Citri* Mass. and by others to *C. elegans* Penz.—*B. B. Higgins.*

2804. VIELWERTH, VL. Americké padli angreštové. [The American powdery mildew of the gooseberry.] *Ochrana Rostlin* 2: 42-43. 1922.—The distribution of this disease in Europe, its cause (*Sphaerotheca mors-uvae*), and control are described.—*E. Baudyš.*

2805. WILLIAMSON, HELEN STUART. The origin of 'Golden Oak.' *Ann. Botany* 37: 433-444. 1923.—*Eidomia catenulata* has been isolated from a specimen of 'golden' oak, both externally and internally. Since this fungus is the only one growing from inside the oak when the latter has been externally sterilized and since it also produces the golden color when grown on normal oak, it is concluded that the golden color in the specimen of oak investigated is due to the activity of *E. catenulata*. This fungus in the infected tissue gives rise to a yellow substance, exuded as globules along the hyphae, which accumulates in the cells and may finally fill them completely, with accompanying disorganization of the hyphae. The hyphae advance in the heartwood along the medullary rays in a transversely radial direction and in the wood parenchyma, fibers, and vessels, usually longitudinally. Passage from cell to cell takes place only through pits in the walls, and there appears to be no delignification or attack on the walls themselves. The source of food for the fungus in the heartwood of oak is probably soluble pectic bodies, glucosides, gallic acid, starch, proteins, or organic salts that may occur. *E. catenulata* produces conidiophores with oval, yellow conidia in long chains; and also hyaline spores, borne singly or in pairs, generally terminally, on lateral branches of the mycelium.—*Margaret Newton.*

DISEASES CAUSED BY BACTERIA

2806. ANONYMOUS. Crown gall with nursery stock. *South African Fruit Grower* 10: 242-243. 2 fig. 1923.—There has been an alarming increase of crown gall (*Bacterium tumefaciens*) in the last few years with heavy losses of nursery stock. The disease has been found to develop on newly broken land, and its occurrence is reported on the roots of veld bushes.—*L. J. Goldblatt.*

2807. ANONYMOUS. Fruit tree diseases and their treatment. Crown gall. *South African Fruit Grower* 10: 33. 3 fig. 1923.—The presence of this disease (*Bacterium tumefaciens* Smith and Townsend) is usually due to infected nursery stock.—*L. J. Goldblatt.*

2808. BROWN, J. G., AND FREDERICK GIBSON. **A new host for *Bacterium Malvacearum*.** *Phytopathology* 13: 455-457. 2 fig. 1923.—Plants of Arizona wild cotton (*Thurberia hesperoides*) were inoculated with a pure culture of *Bacterium Malvacearum* from the Pima-Egyptian strain of cotton [*Gossypium*]. Typical leaf spots and 1 branch infection were produced.—*B. B. Higgins*.

2809. COOK, MELVILLE T. **Early stages of crown gall.** *Phytopathology* 13: 476-482. 14 fig. 1923.—This study was undertaken to determine the sequence of the very early stages of crown gall and the relation of the crown gall organism to them. Young seedlings of castor bean [*Ricinus communis* L.] and of *Bryophyllum* were used. Longitudinal slits, made through the cortex and into the central pith tissue, were filled with the crown gall organism (*Bacterium tumefaciens* E. F. S.). Some of the wounded plants were held without inoculation as controls. At 2-day intervals material was killed and embedded, and later sectioned and stained. The reactions due to wound stimulus were: an increase in number of layers of cortex cells; an increase of pith and medullary ray cells; an occasional increase in the thickness of the cambium; and, when the slit was through a vascular bundle, a distortion of the xylem due to growth of other tissues, and an increase in the phloem elements. In the inoculated plants similar reactions occurred before any response to the parasite could be detected. The 1st reaction attributable to the crown gall organism was the formation of a "whorl" in the cortex or the medullary ray tissue in close proximity to the cambium, consisting of a spherical mass of growing cells of various sizes of much richer protoplasmic content than the surrounding cells. Later, but before the whorl has broken through the epidermis, cells throughout the whorl are transformed into tracheal elements. Each gall contains 1-several of these whorls. Tumor strands arise either in the cortex between 2 adjacent bundles or in the pith. They exert great pressure upon the surrounding tissues; and in later stages the vascular bundles are so distorted that it is difficult to distinguish the various elements of the gall. Only meristematic tissues are stimulated by the parasite; but primary meristem (cambium) does not respond so quickly as in some other galls.—*B. B. Higgins*.

2810. CRUESS, W. V., AND E. H. GUTHIER. **Bacterial decomposition of olives during pickling.** *California Agric. Exp. Sta. Bull.* 368. 15 p., 5 fig. 1923.—This investigation is discussed under the following headings: nature of the decomposition, organisms responsible, sources of infection, relative susceptibility of different varieties of olives, effect of different temperatures during pickling, effect of storing the fruit in brine before pickling, and control by (a) hastening the washing process, (b) pasteurization, (c) lye treatment, and (d) pasteurization and subsequent lye treatment.—The disease is caused by gas-forming and other bacteria present in or on the fruit, vats or other equipment. Storage in brine for 4 weeks or longer permits decomposition of fermentable material (sugars, etc.) before pickling and without injury to the fruit, which is then resistant to the injurious fermentation during pickling. Use of wash water above 60°F. greatly increases the susceptibility of olives to fermentation. Pasteurization at 175°F. for 30 minutes has proved effective in control of the disease under factory conditions. In factories using warm water, fermenting olives should be pasteurized; in those using cold water fermentation may be arrested by lye treatment. Where the disease has become thoroughly established the vats should be sterilized with boiling water and great care exercised to avoid transfer of bacteria from infected to sound vats.—Fruit should be stored no longer than necessary in dilute brine after pickling, and should be canned as soon as possible after free from lye.—*Frederick V. Rand*.

2811. LEE, H. ATHERTON. **Phytopathological notes. Gum disease of sugar cane in the Philippines.** *Phytopathology* 13: 504. 1923.—Comparison of the red vascular disease, previously reported from the Philippines, with Cobb's gum disease [*Bacterium vascularum* Cobb] showed them to be identical.—*B. B. Higgins*.

2812. LEVINE, MICHAEL. **Studies on plant cancers—IV. The effects of inoculating various quantities of different dilutions of *Bacterium tumefaciens* into the tobacco plant.** *Bull. Torrey Bot. Club* 50: 231-243. 1923.—Various dilutions of a given culture of *B. tumefaciens* were used for inoculating tobacco plants of uniform age and size growing under the same conditions. No constant difference was noted between size of gall from undiluted emulsion and that from a suspension 40 times more dilute. Suspensions from cultures 2 days old were

no more virulent than from cultures 21 and 40 days old. The conclusion is drawn that the number of bacterial cells is not significant in determining the size of the crown gall, but that this is dependent rather on the region of the host inoculated and on the vitality of the host.—*P. A. Munz.*

2813. MERRILL, J. H. Review of Ohio Bulletin No. 357.—Dissemination of fire-blight. *Amer. Bee Jour.* 63: 72-73. 1923. [See also *Bot. Absts.* 12, Entry 2037.]

2814. RAEDER, J. M. Preliminary results with the use of sulphur for the control of potato scab in Idaho. [Abstract.] *Phytopathology* 13: 512. 1923.

2815. RICHARDSON, J. K. A study of soft rot of Iris. *Ann. Rept. Quebec Soc. Protection of Plants* 15: 105-120. *Pl.* 5-7. 1922-1923.—Soft rot of Iris is widespread in western Quebec and has reduced the 250 varieties at MacDonald College to 130. The paper deals with symptoms, etiology, inoculations, cultural studies, and pathological histology. The pathogen appears to be a strain of *Bacillus carotovorus* Jones.—*B. T. Dickson.*

2816. ROBINSON, WILFRID, AND H. WALKDEN. A critical study of crown gall. *Ann. Botany* 37: 299-324. *Pl.* 5-6, 4 fig. 1923.—The effect of the stimulus by *Bacterium tumefaciens* is to produce a growth very similar in form, structure, and general appearance to callus growths on woody shoots arising as a result of wounding. At first the bacteria are located on the wounded surface, and to some extent also in the vessels and intercellular spaces of the cortex. Further development of the gall is due mainly to the active presence and multiplication of the bacteria on the rough external surface of the gall, where the bacteria are much more numerous than in the interior. This explains the earlier difficulties of workers in isolating *Bacterium tumefaciens* from the interior of sterilized galls. Most of the work of Erwin F. Smith regarding the production of secondary tumors was repeated by the authors, but additional results were obtained which show that the facts bear interpretations different from those adopted by Smith. Both in *Chrysanthemum frutescens* and in *Nicotiana affinis*, zoogloal strands of the organism are found intruding along intercellular spaces and protoxylem vessels forming centers for pathological disturbances and gall production along the tract. The primary and secondary galls and tumor-strands arise by subdivision and subsequent proliferation of preëxisting cells of the host plant in the presence of the bacterial stimulus. There is no invasive growth of tumor-tissue over any considerable distance. The intrusive growth of the bacteria in the intercellular spaces and in protoxylem vessels, together with growth extension of inoculated tissues, fully accounts for the strands of tumor-tissue connecting the secondary galls with those arising at the points of inoculation. The results obtained regarding the distribution of the bacteria in the galls invalidate most of the close comparisons which have previously been made between crown gall and malignant tumors. In a foot-note the authors state that since completing their paper they have seen a recent paper by Smith [see *Bot. Absts.* 12, Entry 5857] in which he expresses the opinion that most, if not all, tumor strands originate as a result of the stimulating effect of the bacteria either within the cells or acting at a distance, thus receding from his earlier position that tumor strands and secondary galls originate by the intrusive growth or infiltration of tumor tissue. He still maintains that the tumor is due to an "intracellular schizomycete."—*Margaret Newton.*

2817. WELLES, COLIN G., AND EMILIANO F. ROLDAN. Another economic host of *Bacterium Solanacearum*. *Phytopathology* 13: 488-491. 2 fig. 1923.—A destructive wilt disease of mature taño plants (*Chrysanthemum coronarium* L.), occurring in the garden of the College of Agriculture, Los Baños, Philippine Islands, was found to be due to *Bacterium Solanacearum*.—*B. B. Higgins.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

2818. ANONYMOUS. [Rev. of: HOUARD, C. Les zoocécidies des plantes d'Afrique, d'Asie et d'Océanie. (The zooecidia of plants in Africa, Asia and Oceanica.) 2 vol. 1056 p., 1909 fig., 4 portraits. Jules Hermann: Paris, 1922. (see *Bot. Absts.* 13, Entry 2824).] *La Nature* 1923: 152 (Supplement). 1923.—"The whole, remarkably presented and edited, forms a work of the first order which zoologists, botanists, and agriculturists will consult with profit."—*Frederick V. Rand.*

2819. CHITTENDEN, F. H. The striped cucumber beetle and how to control it. U. S. Dept. Agric. Farmers' Bull. 1322. 16 p., 16 fig. 1923.—[*Diabrotica vittata* Fab. is the principal summer and winter vector of *Bacillus tracheiphilus* E. F. S.]—Frederick V. Rand.

2820. FAES, H. ET M. STAEHELIN. L'utilisation des gaz toxiques dans la lutte contre les insectes nuisibles. [Use of toxic gases for control of injurious insects.] Ann. Agric. Suisse 24: 9-18. 1923.—The subject is reviewed and the results of experiments are recorded.—Frederick V. Rand.

2821. FRANCHINI, G. Action des latex végétaux sur différents protozoaires. Culture de trypanosomes dans les latex. (2^e note.) [Effect of plant latex on various protozoans. Culture of trypanosomes in latex.] Bull. Soc. Path. Exotique 16: 256-263. 1923.—Protozoa from man or animals, including 6 species of *Trypanosoma*, 2 of *Crithidia*, and 7 intestinal amoebae or flagellates, were incubated (on glass slides or in tubes), in latex of various plants (8 species of *Euphorbia*, 4 of Asclepiadaceae, 5 of Apocynaceae, 1 of Artocarpaceae and 2 of Urticaceae). Trypanosomes developed well in latex of certain plants; less favorably in others. In every latex tried they remained alive longer than in physiological solution or in citrate solution. Crithidian forms live in the latex of various plants, longer than most trypanosomes. Vegetative forms of *Amoeba*, *Lamblia*, and other protozoans of the intestines of man or animals are not resistant, but encysted forms are viable after several months' incubation in latex.—Philip Brierley.

2822. FROGGATT, WALTER W. Forest insects of Australia. viii + 171 p., 44 + 2 col. pl., 32 fig. Government Printer: Sydney, 1923.—This work, which embodies the results of many years of investigation, is a fund of both practical and scientific value. It will be of special value to those interested in forestry, architecture, or industries in which wood as a material is employed.—The 1st 3 chapters take up respectively plant galls, white ants, and wood-boring beetles injurious to timber trees. The remaining 18 chapters consider in turn insects attacking different tree species.—Frederick V. Rand.

2823. HAWLEY, I. M. Insects and other animal pests injurious to field beans in New York. New York [Cornell] Agric. Exp. Sta. Mem. 55. 945-1037, pl. 69-71, fig. 86-101. 1922.—In addition to the discussion of animal pests of field beans, a section is devoted to the rôle of insects in transmitting diseases of this crop.—Frederick V. Rand.

2824. HOUARD, C. Les zoocécidies des plantes d'Afrique, d'Asie et d'Océanie. Description des galles. Illustration. Bibliographie détaillée. Répartition géographique. Index bibliographique. [The zoocécidia of plants in Africa, Asia and Oceania.] 2 vol. 1056 p., 1909 fig., 4 portraits. Jules Hermann: Paris, 1922.—The main sources of material and larger works on the subject for this territory are briefly referred to in the introduction. The same method of compilation is used as in the author's previous work on cecidology (HOUARD, C. Les zoocécidies des plantes d'Europe et du bassin de la Méditerranée. [The zoocécidia of plants in Europe and the Mediterranean Basin.] 3 vol. 1560 p., 3 pl., 1566 fig., 8 portraits. 1908, 1909, 1913.) Plants bearing galls are discussed in the taxonomic order of Engler and Prantl's Pflanzenfamilien. Galls under each plant species are grouped according to location on the host and type of gall produced. Illustrations are largely from the author's own material. The concise description of each gall is followed by a quite complete bibliography. The 2nd volume contains a general bibliography arranged alphabetically according to authors. In bibliographies of *Phylloxera radicicola* and *Myzoxylus laniger*, papers of purely practical interest are omitted. The literature of *Heterodera radicicola* is briefly treated since the works on this subject for "l'Ancien Continent" are still somewhat rare. The "domaties" of various authors are not included since it is often difficult to consider them as true cecidia. Alphabetical indices of parasites and of host plants complete the work. [See also Bot. Absts. 13, Entry 2818.]—Frederick V. Rand.

2825. PAOLI, G. La "rissetta" delle viti. ["Rissetta" curl of grape.] Redia 15: 181-189. 2 fig. 1923.—A disease which destroys the flowers and injures the vines has been noticed in the Ligurian Alps since 1921. On affected vines the internodes become shortened, and the leaves distorted and perforated. The trouble is thought to be due to a Capsid bug of the genus *Lygus*.—Frederick V. Rand.

2826. SCHULZE, P. Eriophyina. Gallmilben. [Gall mites.] Biol. Tiere Deutschlands. Pt. 21. 52-60, 2 fig. Gebrüder Borntraeger: Berlin, 1923.—This paper on gall mites forms part of a general treatise on the biology of the fauna of Germany.—Abst. in Rev. Appl. Entomol. 11, Ser. A, Pt. 7, p. 338, 1923.

2827. SEURAT, L. G. Histoire naturelle des nématodes de la Berbérie. Première partie—morphologie, développement, éthologie et affinités. [Natural history of nematodes of Barbary. 1st part, morphology, development, habits and relationships.] vi + 221 p., 34 fig. S. Stamel: Algiers, 1920.—This includes a discussion of the parasitism of nematodes, largely from the standpoint of their pathogenicity to animals. The following nematodes attacking plants are present in Algeria: *Heterodera schachtii* Schmidt, on beets, *H. radicola* and *Tylenchus devastatrix* Kuehn on numerous hosts, *Tylenchulus semipenetrans* Cobb on the orange. Soil-inhabiting nematodes are more resistant than other types to unfavorable conditions when in the encysted larval stage. Nematodes may be parasitized by bacteria, fungi (species of *Catenaria*, *Myzocyttium*, *Protascus*, *Harposporium*, and *Arthrobothrys*), flagellates, and protozoa. An extensive bibliography is added.—Harry Braun.

2828. WEISS, HARRY B., AND RALPH B. LOTT. Notes on *Rhodoabaenus 13-punctatus* (Ill.), the cockle-bur bill bug. Entomol. News 34: 103-106. 1923.—The insects puncture the stems and bases of the petioles, the injured places becoming black and distorted. The life history of the insect is described, and host plants mentioned are species of *Ambrosia*, *Helianthus*, *Oenothera*, *Xanthium*, *Vernonia*, *Cirsium*, *Silphium*, *Eupatorium perfoliatum* and *Polymnia Uredalia*.—O. A. Stevens.

2829. WEISS, HARRY B., AND RALPH B. LOTT. Notes on the *Desmodium* sawfly, *Atomacera desmodii* Dyar. Entomol. News 34: 167. 1923.—The host plant *Meibomia* (*Desmodium*) *canadensis* is common in the northern half of New Jersey. The insect deposits eggs in the upper surface of the leaves, causing blister-like swellings which become tinged with red. The larvae skeletonize the lower surface of the leaf, this sometimes causing plants to die.—O. A. Stevens.

2830. WHELAN, DON B. Will the alfalfa weevil ruin Idaho's bee industry? Amer. Bee Jour. 63: 37-38. 1923.—Spraying of alfalfa for the control of the alfalfa weevil has caused complaint among beekeepers, some of whom in the Boise-Fayette valley are reported to have removed. Without spraying there are few, or no blossoms. Spraying with calcium arsenate (2 pounds per acre), results in full bloom, and if applied early a surplus is stored.—J. H. Lovell.

2831. WHITE, W. H. Nicotine dust for control of the striped cucumber beetle. U. S. Dept. Agric. Dept. Circ. 224. 8 p., 3 fig. 1922.—[*Diabrotica vittata* Fab. is the principal summer and winter vector of *Bacillus tracheiphilus* E. F. S.]—Frederick V. Rand.

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

2832. ANONYMOUS. Treatment of mosaic in Natal. Strong views of the Government Entomologist. South African Sugar Jour. 7: 745-747. 1923.—The Government Entomologist stated that sugar cane mosaic was probably introduced on Argentine cane which had been distributed before the infection was noted. In Zululand, at Felixton, the Port Mackay cane had mosaic. Argentine canes had not been examined. Once established this disease would be hard to eradicate because of the long ratooning period in Natal. It might make difficult the introduction of new and improved varieties of cane. To eradicate mosaic all Argentine and other diseased canes would have to be destroyed, which would require a new bill, as the present Agricultural Pests Act is insufficient.—C. Rumbold.

2833. BONCQUET, P. A. Discovery of curly leaf of sugar beets in the Argentine Republic. Phytopathology 13: 458-460. 1923.—Curly leaf of the sugar beet was found in several localities of the Argentine Republic. The carrier of the disease (*Utettix tenella*) was found widely distributed over the country.—B. B. Higgins.

2834. FOLSOM, DONALD. Potato spindle-tuber. Maine Agric. Exp. Sta. Bull. 312. 21-44, fig. 5-14. 1923.—Known causes of abnormal tuber shape are soil conditions, weather conditions, and diseases. One cause is spindle-tuber, a recently named degeneration disease of long standing and wide distribution. Spindle-tuber is compared with mosaic and leafroll,

and is discussed with reference to symptoms, economic importance, tuber perpetuation, natural spread in the field, transmission by aphids and artificial means, and control methods. The securing and isolation of disease-free stock is recommended.—*Donald Folsom*.

2835. HUNGERFORD, CHAS. W. Preliminary results of experiments with leaf roll and mosaic in Idaho. [Abstract.] *Phytopathology* 13: 511-512. 1923.

2836. MURPHY, PAUL A. Investigations on the leaf-roll and mosaic diseases of the potato. *Jour. Dept. Agric. Ireland* 23: 20-34. 11 fig. 1923.—The history of these diseases is outlined. The importance of tuber perpetuation is increased by the perennation of the potato in Ireland (even in rotation). A hot, dry season masked mosaic. Leaf-roll reduced the yield rate over 60%, but not in proportion to the susceptibility of a variety. Control of leaf-roll by the removal of diseased hills appears more difficult than by the securing of new, healthy stock. Leaf-roll was transmitted in cage experiments, and apparently also in the field, by capsid bugs (*Calocoris bipunctatus*), by jassids (*Typhlocyba Ulmi*), and by flea-beetles (*Psylliodes affinis*). It was transmitted between sprouting tubers by peach aphids (*Myzus Persicae*). Sprout infestation is apparently the reason why house storage is correlated with a higher rate of degeneration than pit storage. It gives rise through colonies on the planted sprouts to early aerial infestation of the plants in the field, and is controllable by tetrachlor-ethane vapor used at the rate of 1 pound per 1,700 cubic feet containing about 15 hundred-weight of potatoes. Leaf-roll causes starch accumulation previous to the appearance of phloem necrosis, with a resulting excessive expansion of the spongy leaf parenchyma and leaf-rolling. Other means, some artificial, induced leaf-rolling by a similar process, while shading reduced it in leaf-roll plants.—*Donald Folsom*.

PARASITIC PHANEROGAMS

2837. JIVANNA RAO, P. S. A note on South Indian Loranthaceae and their host plants. *Indian Forester* 49: 416-428. Pl. 16-17. 1923.—Some 207 species of 163 genera belonging to 63 families of plants are affected by various Loranthaceae. This fact suggests that the sandal group is very close to these, as of the 109 species of 87 genera and 20 families attacked by the sandal, 35 species of 30 genera and families are also hosts of the Loranthaceae. A list of hosts for various species of *Loranthus* is given. Of 68 hosts given in a family list, 17 are attacked by *Santalum* by means of roots. The families affected by Sandal alone, Sandal and Loranthaceae together, and by Loranthaceae alone are also given.—*E. N. Munns*.

NON-PARASITIC DISEASES

2838. ANONYMOUS. Fruit tree diseases and their treatment. Collar rot of orange trees. South African Fruit Grower 10: 5. 3 fig. 1923.—This disease is induced by unsuitable soil conditions. The essential of the curative process seems to be exposing the base of the trunk and of the main roots to light and air.—*L. J. Goldblatt*.

2839. BUSCALIONI, L., E G. ROCCELLA. Sopra una particolare reazione delle foglie di taluni Eucalyptus tenute all'oscuro, sotto stagnola. [Intumescences on Eucalyptus kept in the dark in a dormant condition.] *Malpighia* 29: 367-392. 8 fig. 1922.—Small outgrowths appeared on the leaves of *E. cornuta*, *E. diversicolor*, *E. punctata*, and *E. rostrata* held for several months in a dormant condition with little light and poor soil but plenty of water. The excess of humidity is apparently an important causal factor. The macroscopic and microscopic appearance of the growths is described for each species.—*Lillian C. Cash*.

2840. HOFFER, G. N., AND J. F. TROST. The accumulation of iron and aluminium compounds in corn plants and its probable relation to root rots. II. *Jour. Amer. Soc. Agron.* 15: 323-331. 1923.—The absorption of Al compounds by the corn plant is associated with retarded growth and increased susceptibility of certain strains to root rots. When iron compounds gradually accumulate in the nodal tissues growth of stalks may be little affected, but disintegrations of nodal tissues are accompanied by increased susceptibility of the plants to root rot. The specific reactions occurring in nodal tissues of corn plants are extremely complex and are in some way related to increased susceptibility to root rots. In these experiments the microorganisms have served as indicators of the physiological conditions of plants resulting from changes in nutritive relations.—*F. M. Schertz*.

2841. SCHERPE, R. Untersuchungen über die Ursache der Dörrfleckenkrankheit des Hafers. [Investigations of the cause of the dry-spot disease of oats.] Arbeit. Biol. Reichsanst. Land- u. Forstw. 10: 307-353. 1920.—The author reviews previous research upon this non-parasitic disease of oats, wherein it has been asserted that the symptoms of dry-spot are produced by an alkaline reaction of the soil, that the intensity of the disease appears dependent upon the nitrogen content of the soil, and that peculiar chemical transformation products of humus have some relation to the origin of the disease.—The present research embraces field experiments upon a sandy heath soil at Heide in western Holstein, where the disease was severe, and experiments with nutrient solutions aiming to verify some of the aforesaid relationships of the disease.—The disease develops suddenly under seemingly most favorable cultural conditions, especially with saltpeter fertilization. In 1909 it was discovered that manganese sulphate as an apparent catalytic fertilizer acts as a complete preventive of the dry-spot and makes possible also the recovery of affected plants. The complete suppression of the disease is effected by the addition of 1 kgm. of manganese sulphate per acre. The effect is prolonged over a period of at least 3 years where 8.2 kgm. is applied. Potassium permanganate is effective in a less measure.—Experiments with nutrient solutions showed possible injurious effects from calcium bicarbonate taken in by the oat plant, symptoms similar to dry-spot being produced. These injurious effects are obviated by manganese sulphate. Apparently certain readily soluble organic soil ingredients (alkali humus material) and imperfect aeration provide favorable conditions for nitrite formation, and consequently in soil with high content of such organic materials nitrites may exist in relatively large amounts. Proof is presented that alkaline humus material is the primary deleterious agent. The interaction of calcium chloride, calcium carbonate, and humus produces alkali in the soil column. Such disadvantageous changes occur especially in soils rich in humus. Though soils may differ greatly in respect to the origin of their inorganic constituents, they may be very similar in the quality of their humus.—*W. S. Beach.*

2842. STOKLASA, JULIUS. Die Beschädigungen der Vegetation durch Rauchgase und Fabriksexhalationen. [Injuries to vegetation from smoke gases and factory fumes.] xxiv + 487 p., 21 pl. (several col.), 36 fig. Urban & Schwarzenberg: Berlin, 1923.—After an introductory section the following main topics are discussed; (1) origin and presence of SO_2 and H_2SO_4 ; (2) experiments relative to injuries by H_2SO_3 ; (3) possible acceleration of the toxic action of H_2SO_3 by heat and light; (4) influence of SO_2 on transpiration; (5) classification of injuries to vegetation by H_2SO_3 ; (6) possible employment of catch crop methods in examinations for acid injuries; (7) nature of the injurious influence of H_2SO_3 on vegetation; (8) influence of SO_2 on the photosynthetic assimilation of CO_2 ; (9) destruction of chlorophyll by H_2SO_3 ; (10) injurious action of H_2SO_3 on plant protoplasm; (11) toxic action of "Sulfations;" (12) toxic action of SO_2 on the human and animal organism; (13) relations of SO_2 to respiration of bacteria and plants; (14) possible injury by SO_2 to the chemical and biological relations of the soil; (15) influence of SO_2 , H_2SO_3 , and H_2SO_4 on the atmospheric, geological, and vegetative relations in coal districts; (16) influence of selenium on metabolism in the presence and in the absence of radioactivity of the air and earth; (17) quantitative determination of H_2SO_4 in injured and uninjured soil; (18) quantitative determination of SO_2 and H_2SO_4 in the air and in atmospheric precipitations; (19) chemical investigations of plant organs injured by SO_2 and SO_3 ; (20) which vegetative processes undergo intoxications by SO_2 and by H_2SO_3 and H_2SO_4 and which check these unfavorable actions? (21) palliative and preventive measures against gas injuries; (22) legal measures for averting smoke injuries; (23) bibliography of 15 pages.—*Frederick V. Rand.*

DISEASES OF UNKNOWN CAUSE

2843. DARNELL-SMITH, [G. P.], AND HENRY TRYON. Banana bunchy top disease. Queensland Agric. Jour. 19: 32-33. 1923.—An account is given of investigations of several theories relating to possible agencies promoting the disease.—*W. D. Francis.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

2844. ANONYMOUS. Fruit tree diseases and their treatment. A bacterial spot of citrus fruits; some blemishes of citrus fruits caused by physical agencies. South African Fruit Grower 10: 210. 4 fig. 1923.—Bacterial spot of citrus (*Bacillus citrimaculans* Doidge) is limited to the Western Cape Province, where its prevalence is probably due to the winter rainfall.—Citrus fruits may be injured by hail or excessive cold. The temperatures at which oranges can be stored without risk of discoloration lie between 43 and 50°F.—*L. J. Goldblatt*.

2845. BALÁČEK, B. Zrůstání bramborů. [Growing-through of potatoes.] Naše Snahy 00: 2. 1921.—When rain comes after a dry period at the end of a season, as in 1921, the growth of secondary "daughter-tubers" takes place. These rot readily during overwintering, and the author recommends their removal before storing.—*E. Baudyš*.

2846. BAUDYŠ, E. Zdravověda bramborů a nemoce na nati a hlízách pozorovatelné. [Potato hygiene and diseases of potato leaves and tubers.] Naše Snahy vol. 00: 97–100. 1922.—This is a popular description of the economically most important potato diseases.—*E. Baudyš*.

2847. BEWLEY, W. F. Diseases of glasshouse plants. 208 p., frontispiece + 47 fig. Ernest Benn: London, 1923.—"The book thus combines the best empirical knowledge of the grower with the results obtained by the scientific observer; the facts have been carefully sorted, the deductions thoroughly examined, and in consequence, Dr. Bewley has been able to present to the growers sound information which cannot fail to help in the management of their nurseries, while his record of observations will prove of great assistance to plant pathologists." [From Foreword by Sir JOHN RUSSELL.]—Chapter 1 takes up hygienic conditions of glasshouses in relation to health and disease in plants; chapter 2, disease conditions of plants due to environmental factors, such as light, heat, humidity, soil, etc.; chapters 3 and 4, diseases due to fungi; chapter 6, diseases due to bacteria; chapter 7, mosaic diseases; chapters 8 and 9, general reflections and considerations on disease treatment. An appendix listing tomato diseases found in England is followed by a selected bibliography.—*Frederick V. Rand*.

2848. BRITTAİN, W. H. Five years' spraying and dusting experiments. Ann. Rept. Fruit Growers' Assoc. Nova Scotia 59: 53–72. 1923.

2849. BUTLER, E. J. Phytopathology in the United States. Kew Bull. 1922: 85–91. 1922.—The writer attended the conferences of the American Phytopathological Society at St. Paul, Minnesota, and Fargo, North Dakota, and visited various scientific bureaus and departments. He summarizes the results of his observations on the work being done along phytopathological lines, its value, results, and the impetus it will give to mycological studies.—*T. J. Fitzpatrick*.

2850. CAESAR, L. Some notes on spray matters. Ann. Rept. Quebec Soc. Protection of Plants 15: 28–34. 1922–1923.—Spraying currants in 1919 at Burlington, Ontario, with 3–4 applications of Bordeaux prevented defoliation by *Pseudopeziza Ribis*. The 4th spraying did not add sufficient benefit to justify it. The buds on sprayed plants were 100% better than on unsprayed plants in the spring of 1920.—If apple spraying is well done casein-lime spreader is not necessary.—A test in 1922 indicates that liquid is better than dry lime-sulphur.—In 1922 McIntosh developed 66.6% late scab, Fameuse 24.2%. Spraying as late as possible to finish before the pink spray should begin is recommended.—*B. T. Dickson*.

2851. CARON, OMER. The seed plot as a measure of protection. Ann. Rept. Quebec Soc. Protection of Plants 15: 45–47. 1922–1923.—The use of an isolated seed plot, where good cultural methods, thorough roguing, and careful selection are practised, is urged for Quebec farmers.—*B. T. Dickson*.

2852. COCKERHAM, K. L. A manual for spraying. xi + 87 p., 8 fig. Macmillan Co.: New York, 1923.—"It is the author's desire to set forth in a simple and accurate manner that information which has accrued from years of experimentation so that the layman or student may easily refer to it."—This popular manual discusses in separate sections spray pumps, insecticides and fungicides, dusting and fumigation; and under crop groups (truck crops, small fruits and berries, citrus fruits, pecans and other nuts, orchard fruits) are given in tabular form the diseases and pests, injury caused, treatment, and "remarks."—*Frederick V. Rand*.

2853. COOK, MELVILLE T. Past and future of plant pathology. Ann. Rept. Quebec Soc. Protection of Plants 15: 14-28. 1922-1923.—The 1st part of this address before the Quebec Society for the Protection of Plants and the Canadian Branch of the American Phytopathological Society comprises an historical survey; the 2nd deals among others with the training requisite to the best work, the need for support of research men, the need for fundamental research, quarantine laws, and the teaching of botany.—*B. T. Dickson*.

2854. COULSON, J. G. Peony diseases. Ann. Rept. Quebec Soc. Protection of Plants 15: 67-70. Pl. 2-3. 1922-1923.—Studies carried on at Macdonald College concern blight (*Botrytis Paeoniae* Oud.); leaf blotch (*Cladosporium Paeoniae* Pass.); Septoria leaf spot (*Septoria Paeoniae* West. var. *berolinensis* Allesch.), collected here in August, 1920; leaf spot probably due to *Phyllosticta* sp.; leaf spot due to *Alternaria* sp.; a root rot due to *Fusarium* sp.; and "mosaic."—*B. T. Dickson*.

2855. CROWLEY, D. J. Preliminary report on rots of the cranberry in Pacific County. [Washington]. [Abstract.] Phytopathology 13: 509-510. 1923.

2856. DELAFIELD, FRANCIS, AND T. MITCHELL PRUDEN. A text-book of pathology with a final section on post-mortem examinations and the methods of preserving and examining diseased tissues. Ed. 12, rev. by FRANCIS CARTER WOOD. vi + 1354 p., 15 pl. (several col.), 809 fig. William Wood and Co.: New York, 1922.—The 1st part—General Pathology—takes up the conditions of disease, changes in the circulation of the blood, regressive tissue changes, progressive tissue changes, inflammation, animal parasites, plant parasites (bacteria, yeasts, molds), relations of micro-organisms to disease, the infectious diseases, malformations, tumors, lesions induced by poisons, general diseases, and lesions in certain forms of death by violence.—Part 2—Special Pathology—discusses the diseases of specific organs and organ systems.—In part 3 are given methods of making postmortem examinations and preserving and examining pathological tissues.—*Frederick V. Rand*.

2857. DICKSON, B. T. Plant diseases of 1922 in western Quebec. Ann. Rept. Quebec Soc. Protection of Plants 15: 43-45. 1922-1923.—Notes are given on 53 diseases. Potato early blight (*Alternaria Solani*) was common and the same fungus severely affected tomato. Pink root of onion (*Fusarium mali*) was found for the 1st time. Powdery mildew of clover (*Erysiphe Polygoni*) gave fields of red clover the appearance of being dusted with flour. *Exoascus Pruni* was widespread on wild plums. *Septoria Paeoniae* var. *berolinensis* was pronounced on peony.—*B. T. Dickson*.

2858. EASTHAM, J. W. Sweet-potato diseases. Agric. Jour. [British Columbia] 8: 83, 86. 1923.—The most serious and destructive disease of sweet potatoes in British Columbia is black-rot (*Sphaeronema fimbriata*.) Other organisms infecting tubers from the soil are an important problem. Recommendations directed toward preventing the introduction of these diseases into British Columbia sweet-potato areas are given.—*J. W. Eastham*.

2859. GALLI-VALERIO, B. L'adaptation du parasite à l'hôte et son importance au point de vue de la pathologie et de l'épidémiologie. [Adaptation of parasite to host and its importance to pathology and epidemiology.] Schweiz. Med. Wochenschr. 50: 143-148. 1920.—Parasitism is only one of the manifestations of symbiosis,—mutualism, commensalism, parasitism. In nature the 3 forms grade imperceptibly into one another. If it were possible to follow a parasitic species from its origin, a gradual or rapid adaptation from a free living condition through the stages of symbiosis to parasitism would be found. This adaptation to parasitism is of the greatest importance to pathology and epidemiology for it may explain the appearance of new diseases and the sudden spread of known diseases hitherto of rare occurrence, as also infection of a species hitherto considered immune.—One type of adaptation to parasitism is that in which forms living free in soil or humus, when introduced into man or animals, cause disease and even death. In these cases infection is usually direct—from the external medium—and rarely from individual to individual. Hyphomycetes are among the principal representatives of this group, and that they are adapted only temporarily to parasitism is attested by the fact that many of them develop well only at ordinary temperatures.—*Bacillus subtilis* belongs to this group since it causes a grave malady when introduced into the vitreous body of the eye.—Flagellates of the genus *Prowazekia* found in the intestines of man are probably only the free-living *Prowazekias* en route to adaptation for parasitism. The same may be said of certain nematodes. Adapted to symbiosis in man and animals are many

other forms living in the mouth, respiratory tract, and alimentary canal as mutualists or commensalists which suddenly may pass to the parasitic state at a diminution of host resistance or if for any cause they acquire an unwonted virulence. *Bacillus coli* is a typical example. Adaptation of intestinal saprophytes to parasitism is of great interest because of the existence of innumerable races, varieties and subvarieties of bacteria which may cause a whole train of intestinal disturbances.—One of the most interesting types of variation toward parasitism is that in which forms originally in a free state in nature become adapted to symbiotic life in invertebrates, and finally to true parasitism in vertebrates, where they may become modified even to obligate parasitism. The genus *Mycobacterium* is one of the best examples here since forms are well known living free in nature, and as parasites of cold blooded animals, birds, and mammals. The diphtheria group gives evidence also of a gradual adaptation from saprophytism to parasitism. The organisms of hemorrhagic septicemia and of swine erysipelas are apparently a recent adaptation. Chlamydozoan affections also offer typical cases of adaptation of a single virus to different hosts. If the Rickettsia of the insect intestine is similar to the specific agents causing exanthematic typhus, trench fever, and possibly other diseases of man and animals, this may also be a typical example of adaptation of a form living in simple symbiosis in the invertebrate intestine to a parasitic life in vertebrates.—Supporting this point of view experimental medicine has demonstrated the possibility of adaptation of flagellates from the intestines of invertebrates to parasitism in vertebrate hosts. Many examples of such probable adaptations are given, from which it is concluded that the Leishmanias of man and animals have originated from the flagellates of arthropods. The “Leishmanioses” of mammals are, then, but causal infections by the flagellates of arthropods. Recently (1919) Laveran and Franchini have infected mice using pure cultures of *Herpetomonas ctenocephali* which, especially in the mouse liver, gave the Leishmania form.—Many observations in plants parallel these findings, as exemplified in the flagellates of Euphorbias first discovered by Lafont.—Whether vertebrates or invertebrates were the primitive hosts of flagellates is still a moot point. The author considers invertebrates in general more adapted to the passage of a protozoan from free to symbiotic life than are the vertebrates. He discusses the great importance of comparative pathology and parasitology to the study of general pathology and epidemiology, and quotes Fantham and Porter to the effect that “any particular flagellate of insects may be considered as innocuous to vertebrates only after it has been submitted to experimental proof.”—*Frederick V. Rand.*

2860. HECKE, LUDWIG. *Saatgut und Pflanzenkrankheiten*. [Seed and plant diseases.] *Wiener Landw. Zeitg.* 73: 273–274, 281–282. 1923.—This popular presentation of the principles underlying seed treatment for controlling plant diseases refers particularly to cereal smuts, stripe disease of barley, and snow mold of rye.—*F. Weiss.*

2861. HOLLRUNG, MAX. *Die Mittel zur Bekämpfung der Pflanzenkrankheiten*. [Means for combating plant diseases.] 3rd rev. ed., xii + 406 p., 58 fig. Paul Parey: Berlin, 1923.

2862. HÖSTERMANN, GUSTAV, UND MARTIN NOACK. *Lehrbuch der pilzparasitären Pflanzenkrankheiten mit besonderer Berücksichtigung der gärtnerischen Kulturgewächse*. [Text-book of plant diseases due to fungus parasites with special reference to horticultural crops.] 271 p., 104 fig. P. Parey: Berlin, 1923.

2863. HUNGERFORD, CHAS. W. Results of tests with copper carbonate in Idaho. [Abstract.] *Phytopathology* 13: 512. 1923.

2864. KELSALL, A. Control of orchard pests. *Ann. Rept. Fruit Growers' Assoc. Nova Scotia* 59: 95–106. 1923.

2865. LOCHHEAD, W. The protection of plants. *Ann. Rept. Quebec Soc. Protection of Plants* 15: 11–14. 1922–1923.—This presidential address refers to the Canadian botanists and entomologists who “blazed the trail,” and discusses the present tasks of phytopathologists and economic entomologists.—*B. T. Dickson.*

2866. MORSTATT, H. *Bibliographie der Pflanzenschutzliteratur. Das Jahr 1922*. [Bibliography of plant protection literature for 1922.] *Biol. Reichsanst. Land.- u. Forstw.* iv + 163 p. P. Parey: Berlin, 1923. [See also Bot. Absts. 11, Entry 4543.]

2867. MORSTATT, H. *Die Schädlinge und Krankheiten der Kokospalme*. [Parasites and diseases of the cocoa palm.] *Arbeit. Biol. Reichsanstalt Land.- u. Forstw.* 10: 195–242. Fig. 1–15. 1920.—The author lists and discusses the various animal and plant parasites of the cocoa palm. Diseases of unknown or inorganic causes are included.—*W. S. Beach.*

2868. MORSTATT, H. Die Schädlinge und Krankheiten der Sorghumhirse (Mtama) in Ostafrika. [Parasites and diseases of sorghum millet (Mtama) in East Africa.] Arbeit. Biol. Reichsanstalt. Land.- u. Forstw. 10: 243-268. 1920.—The 1st part deals with injuries due to animals, the 2nd part discusses fungi that attack sorghum millet in East Africa.—*W. S. Beach.*

2869. NOVÁK, STAN. Hniloba srdéčková cukrovky. [Heart rot of beets.] Ochrana Rostlin 2: 53-54. 1922.—Calcium and potash fertilizers increase the tendency to heart rots. Wilmorin varieties are particularly susceptible. On small areas a straw mulch is advisable.—*E. Baudyš.*

2870. PETCH, C. E. Some results from spraying and dusting apples in Quebec. Ann. Rept. Quebec Soc. Protection of Plants 15: 94-96. 1922-1923.—Statistics (percentages of scab, insect injury, russetting, foliage injury, and costs) are given of 4 spraying systems employed for 4 years (1919-22) on Fameuse and for 2 years (1921-22) with dry lime-sulphur on McIntosh and Fameuse varieties. Liquid lime sulphur is preferable on the whole to Bordeaux mixture, and "dusting continues to give satisfactory results in some orchards."—*B. T. Dickson.*

2871. RAEDER, J. M. The effect of pre-sprinkling with water on the hot formaldehyde and corrosive sublimate methods of potato seed treatment. [Abstract.] Phytopathology 13: 512. 1923.

2872. SANDERS, G. E. Combinations of dusting and spraying materials. Ann. Rept. Quebec Soc. Protection of Plants 15: 70-75. 1922-1923.—The author discusses lime ratio in Bordeaux, copper combinations with arsenic, lime-sulphur and arsenicals, nicotine combinations, sulphur and arsenicals.—*B. T. Dickson.*

2873. SANDERS, G. E. Dusting versus spraying. Ann. Rept. Quebec Soc. Protection of Plants 15: 34-39. 1922-1923.—"On the whole I have found that experimenters spray more efficiently than the average farmer, while they do not dust nearly so efficiently." The use of blue copper sulphate, hydrated lime and arsenate of lime was introduced in 1918. In 1922 brown copper arsenic dust (18 pounds copper sulphate, 8 of arsenate of lime, and 74 of hydrated lime) and green copper arsenic dust (36 pounds copper sulphate, 20 of arsenate of lime, and 54 of hydrated lime) were as cheap as the materials for liquid sprays. Nicotine dust with 60% of the nicotine volatile is now available.—*B. T. Dickson.*

2874. SANDERS, G. E. White arsenic as an insecticide. Ann. Rept. Quebec Soc. Protection of Plants 15: 76-79. 1922-1923.—The author confines his attention here to white arsenic and the materials and compounds which may be made from it by a single farm operation. The discussion includes (1) dusting directly upon the potato vines, (2) use in baits, and (3) in Bordeaux mixture.—*Frederick V. Rand.*

2875. SMOLÁK, JAR. Moření osiva v suchém létě. [Cereal seed treatment in dry years.] Ochrana Rostlin 2: 3-4. 1922.—Seed harvested in very dry years are particularly liable to seed treatment injury owing to the greater number of breaks in the seed coats. The use of formalin instead of copper sulphate is suggested.—*E. Baudyš.*

2876. STOREY, H. H. The control of cane diseases. Mosaic and streak disease specially dealt with. South African Sugar Jour. 7: 813-823. 1923.—Precautions urged are the practice of good cultivation, choice of healthy seed cane, destruction of diseased cane in the field, no exchange of seed cane with distant estates. As far as known, leaf stripe or downy mildew does not occur on Uba cane in Natal. The Uba variety in Natal appears to be resistant to cane smut and may differ from the Uba variety which suffers from this disease in the Philippines.—*C. Rumbold.*

2877. STRAŇÁK, FR. Fytopathologické názvosloví. [Phytopathological terminology.] Ochrana Rostlin 2: 45-46. 1922.—A commission, appointed to standardize Czechoslovakian phytopathological terminology, has begun with the cereal diseases.—*E. Baudyš.*

2878. TICE, C. Seed potato certification in 1923. Agric. Jour. [British Columbia] 8: 110-111. 1923.—A summary of standards and regulations is given.—*J. W. Eastham.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 2180, 2181, 2206, 2260, 2261, 2262, 2264, 2312, 2379, 2639, 2642, 2960, 2961, 2997, 3028, 3127, 3218, 3221, 3222)

2879. ABRAHAM, A. C., AND J. RAE. The loss of morphine in powdered opium by keeping. *Pharm. Jour.* 111: 28-30. 1923.—Conclusions from a continuation of this investigation are that opium contains both oxidizing and reducing agents and that abundant air causes oxidation, reducing the morphine content. But if the amount of air is materially reduced and fresh air is not admitted, the reducing agents either stop the oxidization entirely or cause a regeneration of morphine. The results submitted by many investigators since the publication of the 1st paper of the series (April, 1922) show that powdered opium kept in an abundance of air loses 0.05-0.12 per cent of its morphine per month.—*E. N. Gathercoal.*

2880. AUERBACH, FR., UND G. BORRIES. Die Bestimmung der Trockenmasse von Kunsthonig mit dem Refraktometer. [Determination of dry weight of artificial honey with the refractometer.] *Zeitschr. Untersuch. Nahrungs. u. Genussmittel* 43: 297-311. 1922.

2881. AZOULAY, L. Le recrutement des vérificateurs de champignons. [Recruiting of mushroom verifiers.] *Bull. Trimest. Soc. Mycol. France* 39: 73-76. 1923.—This paper contains proposals for the verification and inspection of the edible fungi in order to prevent poisonings.—*S. Blumer.*

2882. BENNETT, C. T. International standardization of cinchona bark and its preparations. *Pharm. Jour.* 111: 101-103. 1923.—The chief varieties of barks in commerce are: Crown bark from *Cinchona officinalis*; red bark from *C. succirubra*; Columbia bark from *C. pitayensis*, *C. lancifolia*, and *C. cordifolia*; grey bark from *C. nitida*, *C. micrantha*, and *C. peruviana*; yellow bark from *C. calisaya* and *C. ledgeriana*. Statistics are quoted showing that a very large percentage of the cinchona bark of commerce is from cultivated trees, the species chiefly cultivated being *C. ledgeriana* for its quinine yield, and *C. officinalis*, *C. calisaya* and *C. succirubra* for total alkaloids, cinchonine, quinidine and cinchonidine admixed with quinine. The monographs in the pharmacopoeias of the world present not only a wide variation in the species of *Cinchona* yielding the drug, but also a considerable variation in the percentage of total alkaloids and of quinine. A review of the official assay processes with their limitations and defects leads the author to present a modified process to be known as the international assay. A comparison of the galenical preparations of the various pharmacopoeias is also presented indicating the menstruum used, the process of extraction, and the alkaloidal content found in each pharmacopoeia for every preparation. The author recommends that the bark should be standardized for total alkaloids by titration, and that the limits fixed for galenical preparations should be 6-8 per cent of total alkaloids by titration, bark of this strength being usually available.—*E. N. Gathercoal.*

2883. CLARK, A. J., AND W. A. BROOM. The activity of pharmacopoeial preparations of ergot. *Pharm. Jour.* 111: 89-91. 1923.—An investigation of the preparations of ergot according to the methods in the U. S. Pharmacopoeia, the British Pharmacopoeia, and the French Codex indicates that many of these preparations are almost worthless in respect to alkaloidal content. It is stated that no liquid preparation of ergot is satisfactory except when acid is used in the extraction. The methods of standardizing ergot preparations upon the isolated uterus measure only the amine content of the ergot preparation, whereas preparing the dose so that the degree of reversion of the action of adrenalin upon the uterus is measured furnishes a convenient, sensitive, and accurate method of standardizing ergot preparation, as this method determines alkaloids only. Preparations made according to the British Pharmacopoeia extractions are almost devoid of ergot alkaloids, though those made by the U. S. Pharmacopoeia method contain considerable quantities of these principles. The authors state that both methods should be modified so as to extract all the ergot alkaloids, since these are the only known active principles specific to ergot.—*E. N. Gathercoal.*

2884. COPEMAN, P. R. v. D. R. An investigation into the composition of "wilde dagga" (*Leonotis leonurus* R. Br.). Union of South Africa Dept. Agric. Sci. Bull. 28. 9 p., col. pl. 1923.—An approximate analysis of the leaves has been made. An aqueous extract was prepared from the material soluble in alcohol by evaporating the alcohol and adding water to the residue. On steam distillation the extract yielded an oil of which the most important fraction was reddish, had a high boiling point, and showed a strong furfural reaction. From the ethereal extract of the aqueous solution small quantities of a light yellow compound with melting point 184–187°C. and with acid properties was isolated. This extract also yielded traces of a neutral substance, melting point 233–234°C., molecular weight 203. From the amyl alcohol extract was isolated a compound, $C_9H_{10}O_5$, phenolic in character and possessing 1 hydroxyl group. It crystallised with $\frac{1}{2}$ molecule of H_2O and melted at 247–240°C. An acetyl derivative was prepared which melted at 126–127°C. By using lead acetate a 2nd compound with the composition $C_9H_{10}O_5$ was isolated, melting point 229.5–230°C. It also was phenolic in character and formed an acetyl derivative of melting point 135–136°C. These 2 compounds might possibly exert a slight antiseptic action, but they would not be likely to give rise to any powerfully intoxicating effects. On account of their phenolic character and slight solubility in water these compounds would probably exert a mild anthelmintic action such as extracts of the plant have been found to possess.—P. R. v. d. R. Copeman.

2885. DOTT, D. B. Opium powder: loss of morphine on keeping. Pharm. Jour. 110: 241. 1923.—Assays for morphine strength of 4 samples of opium carried over a period of months indicate that it is practicable with proper precautions to prepare an opium powder which will show no appreciable loss of morphine after a lapse of several months.—E. N. Gathercoal.

2886. ФАМЫ, I. R. Manchurian liquorice root. Pharm. Jour. 111: 113–115. 6 fig. 1923.—Manchurian liquorice root, early ascribed to *Glycyrrhiza echinata* and *G. glabra*, has recently been attributed to *G. uralensis*, and the author advances the opinion that it may be derived from *G. pallidiflora*, which grows in the Amur region. It is extensively used in China, standing next to Ginseng in importance in pharmacy. The dry roots, very sweet and slightly mucilaginous, are red externally and usually fibrous and tough internally; they are sold in bales, the pieces being 3–4 feet long. The structure closely resembles that of Spanish and Russian liquorice. The drug yields an average percentage of glycyrrhizic acid, but only traces of sugars. The percentage of ash and aqueous extract come within the limits of the British Pharmacopoeia.—E. N. Gathercoal.

2887. GARRIGUES, ALBERT. Les plantes en médecine; les orges. [Medicinal plants; barleys.] O. Doin: Paris, 1923.

2888. GREENISH, H. G. Specimens of *Cassia acutifolia*, Delile. Pharm. Jour. 110: 239–240. 1923.—Authentic specimens of wild plants of *Cassia acutifolia* from the Khartoum district, Berber and the Dongola, will offer opportunity for further study and comparison between true Alexandrian senna and Arabian senna. Arabian senna commercially is much cheaper, grade for grade, than Alexandrian senna. Whether there is a difference therapeutically, is not known.—E. N. Gathercoal.

2889. GREENISH, H. G., AND C. E. CORFIELD. Note in East African cinchona barks. Pharm. Jour. 111: 95–96. 1923.—Although Java produces most of the cinchona bark of the world, successful plantings are found in East Africa, and an examination of trees in the gardens of the Amani Institute indicate bark rich in alkaloids. In 1913 there were reported on plantations under control of the Institute, 2,143 trees of *Cinchona ledgeriana*, 3,878 of *C. succiruba*, 1,020 of *C. robusta*, and 2,675 of hybrids. An examination of these barks in 1918 indicated as high as 8.41 per cent quinine. The results of assays of 3 specimens are tabulated by the authors.—E. N. Gathercoal.

2890. GREENISH, H. G., AND CYRIL W. MAPLETHORPE. A further examination of *Artemisia brevifolia*. Pharm. Jour. 111: 94–95. 1923.—An examination of stems and roots of dried plants showed no santonin. The leaves yielded against the dried drug 0.579 per cent santonin, but none was obtained from the flowering tops. An examination of leaves made some 3 years previously indicated 0.85 per cent santonin.—E. N. Gathercoal.

2891. GREINIUS, K. Namu vaistai. [Household remedies.] Zelmanija 2: 112. 1922.

2892. GRIER, JAMES. An investigation of Colchicum and its galenicals. Pharm. Jour. 111: 87-89. 1923.—Examination of a number of galenical preparations of Colchicum seed and corms indicates that acids and alkalies and heat should be avoided. Wine of Colchicum prepared from both seed and corm retained its colchicine even after 20 years. The colchicine is fairly stable in the extract. Tincture containing 45 per cent of alcohol keeps well, but the alkaloidal strength of the extract prepared by inspissating the juice of the fresh corm is weakened by the heat used. The experiment showed that only about 45 per cent of the total colchicine of the original corm is present in an extract so prepared.—*E. N. Gathercoal.*

2893. HÄRTEL, F., UND F. JAEGER. Die Untersuchung und Begutachtung von Milchchokolade. [Examination of milk chocolate.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 44: 291-317. 1922.—This is chiefly a chemical study.—*E. E. Stanford.*

2894. HOLMES, E. M. *Euphorbia pilulifera*. Pharm. Jour. 110: 162-163. 1923.—This drug, introduced about 1880 as a remedy in asthma, bronchitis and other diseases of the respiratory organs, was referred to *Euphorbia pilulifera* L. (*E. hirta* L.). It has since been pointed out, by reference to Linne's original specimens, that *E. pilulifera* is identical with *E. hypericifolia*, and that the plant that has passed under the name of *E. pilulifera* is really *E. hirta*. This correction should be made in the pharmacopoeias and works on materia medica. The plant and drug are described in detail, and physical and physiological characters given, as well as methods of use.—*E. N. Gathercoal.*

2895. HOLMES, E. M. Note on cypress oil. Pharm. Jour. 110: 107-108. 1923.—Cypress oil originally introduced in 1892 was distilled from fresh leafy shoots of *Cupressus sempervirens* L., and used as a remedy for the relief of whooping cough. There have since appeared oils from *C. lusitanica*, *C. pyramidalis*, *C. Lambertiana*. *C. Lusitanica* affords a larger percentage of oil, which can be offered at a cheaper price than that from *C. sempervirens*, but the substitute is different therapeutically. The author presents analytical data for the various oils mentioned.—*E. N. Gathercoal.*

2896. HOLMES, E. M. Robinia pods poisonous to sheep. Pharm. Jour. 110: 263. 1923.—Pods of *Robinia pseudacacia*, which according to F. B. Power contain a poisonous protein or toxalbumin called robine, were eaten by sheep, 3 of which died. Symptoms are described.—*E. N. Gathercoal.*

2897. HOLMES, E. M. The herb garden for students. Pharm. Jour. 110: 516-517. 1923.—Hoping to interest pharmacists in the native flora and in cultivating medicinal plants, the author discusses soils, climatic conditions, sources of seeds and potting plants and other valuable information for the cultivation of many medicinal plants that can be grown in most parts of England.—*E. N. Gathercoal.*

2898. JATUL-JATULEVICIUS, P. A. Augmenys Kaipo Vaistai. [Plants as remedies.] Želmenija 3: 119-123. 1923.

2899. J[ATUL], P. A. Iš Musų Botanikos J. B-s. [From our botanist J. B.] Želmenija 2: 88-91, 106-111. 1922.—Further notes from Jonas Basanavicius are presented [see Bot. Abst. 12, Entry 724].—*C. W. Dodge.*

2900. MAPLETHORPE, CYRIL W. A note on coto bark. Pharm. Jour. 110: 238-239. 1923.—The discovery, uses, and chemical examination of this drug are discussed, and a comparison is made between the true Coto bark in the museum of the British Pharmaceutical Society and the *Nectandra Coto* of Rusby. The former is rather harder and not so fibrous as the latter, and there are differences in odor and in structure.—*E. N. Gathercoal.*

2901. MAPLETHORPE, CYRIL W. Examination of the bark of *Erythrophleum guineense*. Pharm. Jour. 111: 85-87. 1923.—Examination of bark from rather young trees in the Amani (East Africa) Research Institute Gardens indicates at least 0.1 per cent alkaloid, which, however, was not crystallized, nor were crystalline salts obtained from it. The bark is used as an ordeal poison in Africa. The alkaloid is claimed to be a heart stimulant resembling digitalin, and to possess local anesthetic properties.—*E. N. Gathercoal.*

2902. POTTS, GEORGE. The pepper tree (*Schinus molle* L.) as a cause of hay fever in South Africa. South African Jour. Sci. 19: 146-195. 1922.—Bloemfontein and Kimberley are subject to severe epidemics of hay fever in the early summer, especially in November and December. By the exposure of pollen plates it was shown that the pollen of the pepper tree is

virtually the only kind of pollen frequent in the air of Bloemfontein during the epidemics. Inoculation tests showed that hay fever patients reacted to pepper-tree pollen, and this was the only kind of pollen found in the nasal discharge of epidemic patients. It is therefore concluded that the pepper tree is the cause of these epidemics, to which indeed they are commonly attributed. An account is given of the climate of Bloemfontein; and it is pointed out that the pollen of this tree, which is normally sticky and carried by insects, becomes dry and powdery and is dispersed by the wind in the hot, dry weather prevalent in Bloemfontein during the epidemic season. Attention is called to many other ways in which the dry climate of Bloemfontein affects the epidemics. The difficulties in accepting the pepper tree as a cause of hay fever are: the large size of the pollen; pollination by insects; and the presence of the tree in many towns of South Africa which are not troubled with hay fever. The explanations suggested are the hot, dry weather during the principal flowering season of the pepper tree, and the fact that this tree is cultivated in large numbers in Bloemfontein as a street and garden tree. Kimberley, with a climate like that of Bloemfontein, and which too has many pepper trees, is also subject to these epidemics. To prevent the epidemics the removal of the male pepper trees is recommended. Other causes of pollinosis and of hay fever symptoms in Bloemfontein are mentioned.

—Geo. Potts.

2903. POTTS, GEORGE. The potency of pepper tree pollen as a cause of hay fever. South African Jour. Sci. 18: 336-341. 1922.—Bloemfontein and certain other towns of the drier inland region of South Africa suffer annually in the early summer from a very virulent form of hay fever which occurs on such a scale as to justify being termed epidemic. The disorder is commonly attributed to the pepper tree, *Schinus molle*, which is grown as a street tree in a number of towns. The power of the pepper tree pollen to cause the disorder was tested by what is known as the cutaneous reaction. Data are given which show that all the susceptible patients reacted strongly to the pollen, and non-susceptible patients were therefore satisfactory as controls. It is claimed that the toxicity of the pepper tree pollen is proved by these experiments.—E. M. Doidge.

2904. POUCHER, W. A. A note on the use of cypress oil. Pharm. Jour. 110: 181-182. 1923.—Cypress oil is used not only as a medicinal agent, but also as a raw material in perfumery. Oil from either *Cupressus sempervirens* or *C. lusitanica* serves the latter purpose, as both possess the characteristic odor of ambergris, and are fixatives in perfume blends. Formulas for fixatives are given.—E. N. Gathercoal.

2905. PRESCHER, J., UND R. CLAUS. Über Holunderbeerwein. [Elderberry wine.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 44: 92-93. 1922.—Analysis indicates no hydrocyanic acid in wine of *Sambucus nigra*. Illness following the use of such wine is presumably due to metallic contamination.—E. E. Stanford.

2906. STANDLEY, PAUL C. The Tambor tree of Salvador. Pharm. Jour. 110: 489. 1923.—Two Euphorbiaceous trees of Salvador were sent to Kew about 1882 by Carlos Dorat, who stated that the seed yielded an oil with the same properties as castor oil, but with the advantage of having an agreeable flavor. To the trees were assigned the names of *Omphalea oleifera* and *O. cardiophylla*. Further investigation indicates that there is but one species present in Salvador, this being *O. oleifera*. The tree, found on the western coast, is known by a number of local names, including Tambor. The author describes the tree and states that the immature fruits are boiled and eaten and have an excellent flavor. The ripe seed are used by the natives for sweetmeats. The most valuable product is the oil from the seed, which is obtained by pressure and is used in cooking and for soap. The seed are used by the natives in preparing a syrup which is said to have pectoral properties, and the latex obtained from wounds in the trunk is used for diarrhea.—E. N. Gathercoal.

2907. WALLIS, T. E. Florida arrowroot, from *Zamia floridana*. Pharm. Jour. 110: 235-238. Fig. 1-6. 1923.—This is an extended review of the botanical and commercial history of Florida arrowroot, with particular reference to the true name of the plant yielding this article. The conclusions are: (1). The plant yielding Florida arrowroot is that named *Zamia floridana* A. DC. by J. K. Small, whose specimen from Miami is in the British Museum; (2) it seems unlikely that Small's *Zamia floridana* A. DC. is identical with *Zamia integrifolia* Aiton, the type specimen of which is also in the British Museum; (3) the identification of Small's *Zamia*

floridana A. DC. with de Candolle's specimen needs further investigation; (4) it is impossible to know whether the *Zamia* starch described by Reichert is from *Zamia integrifolia* Ait. or some other *Zamia*; (5) Reichert's description of *Zamia* starch appears to have been adopted by Clevenger and Viehoveer as representing the starch of Florida arrowroot, which is uncertain; (6) the present paper contains a description of the commercial starch and of the starch from Small's *Zamia floridana* A. DC., and shows that they are identical, the presence of typical calcium oxalate crystals being a useful new means of confirmation.—*E. N. Gathercoal*.

2908. WATT, HENRY E. Note on a sample of opium from the growth of 1852-1853. *Pharm. Jour.* 110: 241-242. 1923.—The specimen is described and results of its assay are given.—*E. N. Gathercoal*.

2909. WIRTHLE, F., UND KARL AMBERGER. Bleihaltiger Tee. [Tea containing lead.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 44: 89-91. 1922.—Commercial tea samples showed visible foil contamination, attributed to action of sea water on the packing. Analyses of tea brewed from these samples showed sufficient lead to make continued use dangerous. Prohibition of leadfoil packing is advocated.—*E. E. Stanford*.

PHYSIOLOGY

B. M. DUGGAR, *Editor*

W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 2143, 2299, 2332, 2382, 2450, 2525, 2569, 2606, 2622, 2703, 2714, 2725, 2786, 2792, 2821, 2840, 2841, 3122, 3130, 3145, 3147)

GENERAL

2910. ALLEN, CHARLES E. The potentialities of a cell. *Amer. Jour. Bot.* 10: 387-398. 1923.—Primitive organisms, such as the flagellates, are notably plastic in form and function. Each function that the cell or one of its parts performs is the expression of a definite potentiality present in that cell, and a cell may transmit to daughter cells potentialities which it may never be able to realize itself. A particular potentiality may be described as the power of responding, by a certain activity, to a definite stimulus. There is also evidence, derived from the occurrence of definite life cycles, that living matter may in part determine the sequence of expression of these potentialities. The range of potentialities shown by a cell under "normal" conditions is usually far less than its possible range under all conditions. During the course of evolution there has evidently been loss, gain, and modification of potentialities, but on the whole much more gain than loss. Cells may adhere in simple colonies, each cell having throughout its active life the full range of possibilities of every other cell. From these conditions much more complex and highly differentiated individuals have appeared, but even here, all the cells of the plant—at least while they remain in an embryonic condition—are still equipotent and totipotent, each being able to give rise to a complete new plant, and all may transmit this totipotency to their offspring. At maturity many vegetative cells have lost the power of division and so cannot display their various potentialities, but there is evidently no fundamental distinction in plants between "germ" and "somatic" cells, nor a progressive distribution of potentialities during ontogeny. In massive plant bodies, the most important part of the environment of a cell is the group of cells by which it is surrounded. The coördinated responses of individual cells brings about growth and development and results in a definite life history. The problems of organic evolution, as, for example, those concerned with the nature and inheritance of "congenital" and "acquired" characters, must be solved eventually by analysis in terms of the individual cell rather than of the organism as a whole.—*E. W. Sinnott*.

2911. BOAS, FRIEDERICH. Untersuchungen über die Mitwirkung der Lipide beim Stoffaustausch der pflanzlichen Zelle. [The coöperation of lipoids in material exchange in plant cells.] *Biochem. Zeitschr.* 117: 166-214. 1921.—The paper is divided into 3 parts. I. The effect of saponin and salts, singly and combined, on the fermentation of yeast. Saponin alone

increases the fermentation. The cations K, Na, NH_4 , and Ba, and the anions Cl, SO_4 , NO_3 and citrate increase the fermentation in the inverse order of their precipitation effect upon lecithin and cholesterol. $\text{Al}_2(\text{SO}_4)_3$ and $\text{Al}(\text{NO}_3)_3$ retard the fermentation. Saponin combined with salts of uni- and divalent cations decreases fermentation and soon kills the cells. Trivalent cations and acids decrease the toxicity of the saponin-salt combination. Saponin and aluminium salts combined increase yeast activity. Non-electrolytes when added to saponin do not affect fermentation. II. Saponin and salts, singly and combined, cause exosmosis of anthocyanins and tannins from cells of higher plants. III. Chloral hydrate kills, but does not plasmolyse yeast cells. The writer concludes that the plasma membrane resembles lipid rather than protein material.—*F. G. Gustafson.*

2912. C[LARK], W. M. [Rev. of: LOEB, JACQUES. *Proteins and the theory of colloidal behavior.* 292 p. McGraw-Hill Book Co.: New York, 1922 (see Bot. Absts. 12, Entry 794).] Absts. Bact. 7: 274-275. 1923.—“The author fails to give experimental details which are necessary for the recalculation of his results.” The book is controversial in tone and limited in perspective. The author makes us question the validity of the Hofmeister series and await further researches. Loeb's book will be a great stimulus to research; but it is of questionable value as a work of reference.”—*D. Reddick.*

2913. MICHAELIS, LEONOR. *Manuel de techniques de physico-chimie et spécialement de chimie des colloïdes à l'usage des médecins et des biologistes.* [Laboratory manual of physical chemistry especially the chemistry of colloids, for the use of medical men and biologists. (Translated from the second edition by H. CHABANIER AND LOBO-O'NEILL.) 205 p., 40 fig. Masson et Cie.: Paris, 1923.

2914. MURRAY, C. D. *The acid-base equilibrium in simple two-phase systems.* Jour. Biol. Chem. 56: 569-591. 1923.—The distribution law and the law of mass action (Henderson's equation) have been combined to yield equations expressing the relation between the distribution of a weak acid between 2 phases, 1 of which is an aqueous solution, and the pH of the aqueous phase. It is suggested that the problem of the Na:Ca ratio in physiology and also other physiological problems might be approached from his point of view.—*G. B. Rigg.*

2915. PRINGSHEIM, H. [Rev. of: CZAPEK, FRIEDRICH. *Biochemie der Pflanzen.* [Biochemistry of plants.] 2nd ed. Vol. 2. xii + 526 p. 1920. Vol. 3. ix + 852 p. 1921. Gustav Fischer: Jena (See Bot. Absts. 12, Entry 5167). Biol. Centralbl. 41: 383-384. 1921.

2916. STILES, WALTER. *Vitalism and mechanism from point of view of the plant physiologist.* Scientia 34: 307-316. 1923.

2917. WURMSER, RENÉ. *L'énergétique et la biochimie.* [Energetics and biochemistry.] Bull. Soc. Chim. Biol. 5: 506-528. 1923.—This is an address in which applications of the principles of thermodynamics to various biological processes are pointed out. A bibliography of 25 titles is appended.—*Joseph S. Caldwell.*

PROTOPLASM, MOTILITY

2918. LEPESCHKIN, W. W. *Über die chemische Zusammensetzung des protoplasmas des Plasmodiums.* [The chemical composition of the protoplasm of plasmodia.] Ber. Deutsch. Bot. Ges. 41: 179-187. 1923.—A complete chemical analysis of the plasmodium of *Fuligo varians* is reported. The chief constituent was found to be a nucleo-protein.—*Karl Sax.*

2919. WALTER, HEINRICH. *Ein Beitrag zur Frage der chemischen Konstitution des Protoplasmas.* [The chemical constitution of protoplasm.] Biochem. Zeitschr. 122: 86-99. 1921.—Plasmodia and sclerotia of living *Fuligo varians*, or of those killed by boiling, were not digested by trypsin or pepsin solutions. When sclerotia were first treated with absolute alcohol, ether, and chloroform and then rinsed with water they readily fell apart into individual cells, some of which had only a thin membrane while others had a thick membrane or wall. Trypsin now completely digested the former in 2 hours, leaving only the empty cells; while pepsin-HCl effected incomplete digestion only. The thick walled cells were not attacked by either enzyme. The walls consist of a cellulose like substance as indicated by the chlor-zinc-iodide and iodine in KI tests. Elodea leaves extracted with absolute alcohol, ether, and chloroform were incompletely digested by pepsin-HCl. Plasmodia extracted in the same way were completely digested by trypsin, the residue consisting of tanbark particles and other im-

purities, and a slimy ground substance containing a few small indefinite bodies and numerous lime concretions. The slimy part surrounded the plasmodium, and was identical with what de Bary called "covering." Pepsin-HCl digestion was incomplete, the outlines of the plasmodia remaining faint. Treatment with alcohol-ether-chloroform extracts all fatty substances or lipoids, and allows the enzymes to act on the protoplasm. The writer concludes that the protoplasm is composed of a phospho protein-like component, digestible by trypsin, and a lipid component which is present in very finely divided particles not only in the plasma membrane but throughout the whole protoplast and which hinders digestion. No simple protein bodies are present. The protoplasm of *Fuligo varians* is not different from that of higher plants.—*F. G. Gustafson*.

2920. WEBER, FRIEDL, UND HEINRICH HOHENEGGER. *Reversible Viscositätserhöhung des Protoplasmas bei Kälte*. [Reversible raising of the viscosity of protoplasm by cold.] *Ber. Deutsch. Bot. Ges.* 41: 198-204. 1923.—The authors tried to determine whether, under normal conditions, the viscosity of protoplasm is lowered by cold. They worked only with long, intact stems of seedlings of *Phaseolus multiflorus*, using the method of centrifuging, observations being made on sections of these stems. The results showed: (1) low temperatures (-2° up to $+6^{\circ}\text{C}.$) continuing for periods varying from a few minutes to many hours raise the viscosity of the protoplasm of the starch-sheath cells; (2) this viscosity is reversible; at room temperature, the viscosity is restored to its original value; (3) upon cooling, the viscosity of the protoplasm of their starch-sheath cells is affected in the same way in uninjured *Phaseolus* seedlings as in microscopical sections through the seedling stems.—*Hally Jolivet Sax*.

DIFFUSION PHYSICO-CHEMICAL PHENOMENA

2921. GRUZEWSKA, MME. Z. *Quelques propriétés physico-chimiques de la laminarine*. [Certain physico-chemical properties of laminarin.] *Bull. Soc. Chim. Biol.* 5: 216-226. 1923.—The author, who has previously studied the effects of the action of enzymes on laminarin from *Laminaria flericaulis* (see Bot. Absts. 12, Entry 5969), has extended her work to a consideration of its physico-chemical properties. It is impossible to purify laminarin by dialysis in collodion sacs, as it passes the membrane from a 20 per cent solution to the extent of 61 to 69 per cent in 48 hours. Fresh solutions show under the ultramicroscope highly refringent particles of varying size, with brownian movement; the addition of strong alcohol or KOH arrests movement and in the case of alcohol there is some clumping of particles. Spontaneous precipitation occurs in solutions allowed to stand for some time. When followed by the ultramicroscope, these exhibit the same massing of particles and cessation of movement seen when alcohol is added. The precipitate, when washed with alcohol and ether and dried in vacuo, does not again dissolve in water. The precipitation can be made a fractional one by successive additions of alcohol. Addition of $\frac{N}{200}$ HCl or saturation of the liquid with oxygen hastens

the onset of spontaneous coagulation, while addition of $\frac{N}{200}$ NaOH, H_2O_2 , paraffining the walls of the tube, or hermetically sealing in vacuo delay but do not prevent its occurrence. Laminarin is therefore an unstable colloid which undergoes a slow but constant transformation. Under certain conditions, the addition of alkalies results in the formation of rectangular crystalline platelets; investigation is in progress to determine whether these are crystalline laminarin or its sodium compound.—*Joseph S. Caldwell*.

2922. HARDY, W. B. *The micelle—a question of notation*. *Nature* 112: 537. 1923.—This word was introduced by Nägeli in 1877 to describe the unit of the colloidal state. The application of the term by McBain to the writer's "colloidal ion" is wrong. Lack of familiarity with the literature, as between chemists and biologists, is responsible for such occurrences.—*O. A. Stevens*.

2923. HUSS, HARALD. *Untersuchungen über die Quellung der Stärkekörner*. [The swelling of starch-grains.] *Ark. för Bot.* 18³: 1-23. 1922.—Starch grains were found to be stained in dilute aqueous solutions of the following stains: methyl violet, thionin, malachite green, methyl green, safranin, methylene blue and Bismarck brown (vesuvin), but are not

stained in dilute solutions of eosin, congo red, brilliant blue, water blue, phenol red, and azolitmin. When starch grains through mechanical pressure, heating in water until the initial state of swelling is reached, or through chemical reagents have been changed in their structure, they absorb the last mentioned stains too. It is often more convenient to use these stains instead of polarised light in studying the swelling of the grains. Some instances are quoted where the progress in swelling of the grains in hot water was studied with congo-red. Amyloerythrin was found by the author in the starch grains of potatoes, wheat, rye, rice, barley, oats, and bananas as well as in the cell-sap of potatoes and bananas.—*O. Heilborn.*

2924. LEVENE, P. A., AND H. S. SIMMS. Calculation of isoelectric points. *Jour. Biol. Chem.* 55: 801-813. 1923.

2925. MANTON, H. Les travaux de J. Loeb sur l'influence de la concentration en ions H sur les propriétés des colloïdes organiques amphotères et de la gélatine en particulier. [Loeb's work on the influence of H-ion concentration on the properties of amphoteric organic colloids, particularly gelatin.] *Bull. Soc. Chim. Biol.* 4: 43-60. 1922.—This is a review of the series of papers published by Loeb in the *Journal of General Physiology*, volumes 1-3.—*Joseph S. Caldwell.*

2926. PRAT, SILVESTR. Plasmolyse und Permeabilität III. [Plasmolysis and permeability.] *Ber. Deutsch. Bot. Ges.* 41: 225-227. 1923.—The tips of leaves of *Utricularia vulgaris* were observed during plasmolysis by different salts. The author concludes that the whole plant has a semi-permeable covering.—*Hally Jolivet Sax.*

2927. SEIFRIZ, WILLIAM. Observations on the reaction of protoplasm to some reagents. *Ann. Botany* 37: 489-510. 4 fig. 1923.—Leaves of *Elodea* sp. were treated with ethyl alcohol at various concentrations and with the glucosides saponin, smilacin, and senegin. There was much variability in the sensitivity of different cells of the same leaf and of different leaves. Data are given concerning the average length of life of the cells in different concentrations and the percentages killed in different lengths of time in a given concentration. With ethyl alcohol there is at first a reduction of osmotic pressure within the cells as judged by critical plasmolytic concentration. This is followed by a rise until the osmotic value is much greater than in the untreated cell. The same changes take place upon treatment with 1 per cent solutions of the glucosides, and in the case of saponin it was possible to show that the initial fall in osmotic pressure is due to increased permeability and consequent exosmosis of cell contents. The similar fall on treatment with alcohol is believed to be due to the same cause. All the reagents cause a pronounced stimulation of protoplasmic streaming.—*W. P. Thompson.*

2928. UMEZAWA, JUNICHI. The effect on the membrane osmosis by the salt present in the solvent. *Jour. Biochem. Tokyo* 2: 525-540. 18 fig. 1923.—Employing a special osmometer with a collodion bag, the author has made a large number of experiments on the effect of the presence of a salt on both sides of the membrane upon the rate and amount of water passing the membrane. The results are expressed in a series of graphs with accompanying comments. The author regards his results as confirmatory of Loeb's conclusions as to the effects of similarly or oppositely charged ions upon the rate of diffusion of water through membranes.—*Joseph S. Caldwell.*

WATER RELATIONS

2929. HABER, BRUNO. Beiträge zur Kenntnis der Wasserbewegung in der Pflanze. [Water movement in plants.] *Ber. Deutsch. Bot. Ges.* 41: 242-245. 1923.—The author used *Sequoia gigantea*. He concludes that the tension necessary for the water movement does not increase in proportion to length of the paths of conveyance, but that the decrease of transpiration and the increase of conductivity make possible the lifting of water to great heights by suction. According to the cohesion theory the movement of water is completely explained by osmotic suction.—*Hally Jolivet Sax.*

2930. ВАЛЕНСКИЙ, В. Р. [ZALENSKI, V. R.] О физиологическом Воздействии Мглы на растения. [The physiological action of high humidity upon plants.] *Известия Саратовской Обласной Сельско-Хоз. Опытной Станции.* [Bull. Saratov (Volga country) Agric. Exp. Sta.] 3: 1-22. 1921.—In conjunction with A. W. Doroshenko, there has been determined the effect of temperatures of 35-40°C. on the position of the stomatal apparatus. When pieces of

leaves taken from the heads of cabbage are placed in the thermostat for 1-2 days the stomatal opening was abnormally large, the starch of the guard cells being transformed into maltose with a consequent increase in the osmotic pressure leading to the abnormal opening of stomata. At the temperature indicated this opening of stomata occurred even in dry air and with withered leaves. Further investigation indicated a similar phenomenon in about 50 species of plants, the majority of which were affected after an interval of 4-36 hours. *Panicum miliaceum* was not affected by this treatment while *Avena sativa* responded in 4 hours. The author assumes that the high temperature induces a state of rigor in the protoplasm, greatly diminishing the synthetic processes, while enzyme action continues normally.—In periods of excessive heat in the open, phenomena comparable with the result observed have been reported.—B. M. Duggar.

MINERAL NUTRIENTS AND SALT RELATIONS

2931. CURTIS, OTIS F. The effect of ringing a stem on the upward transfer of nitrogen and ash constituents. Amer. Jour Bot. 10: 361-382. 1 fig. 1923.—To determine whether or not nutrients (N and ash) are carried upward from root to leaf in the transpiration stream, the author performed ringing experiments on privet, peach, and lilac. A ring hinders the movement of N and ash into the leaves above the ring, both when the ring is made in the spring before the leaves open and the new xylem is laid down, and when it is made in the summer after they have opened and the new xylem is partly or fully formed. When NaNO_3 is added to the soil the N and ash contents of the leaves from unringed stems increase much more than do those of leaves from ringed stems. This is true whether data are expressed per unit of dry weight, per unit of leaf surface, or as absolute quantities. To determine whether the low N content of the leaves above the ring might not be due to accumulation of N in the stem, ringed and unringed stems of *Ligustrum* were analyzed, and in every case the ringed stems showed a lesser N content. Ringing was found to result in a distinct increase in the ratio of bark to wood in the region above the rings. An attempt was made to eliminate the influence of altered transpiration or of change in carbohydrate content, and evidence was obtained that the low N content above the ring is not due to a lessened transpiration or to a changed carbohydrate content. The data cannot be considered as conclusively proving that N or other nutrients move upward primarily through the phloem and not through the xylem, for the treatments may have altered the xylem tissues, although the leaves above a ring rarely show withering. Aside from such a contingency, however, these ringing experiments offer strong evidence that nutrients are carried in the phloem.—E. W. Sinnott.

2932. JONES, LINUS H., AND J. W. SHIVE. Influence of ammonium sulphate on plant growth in nutrient solutions and its effect on hydrogen-ion concentration and iron availability. Ann. Botany 37: 355-379. 1923.—Using methods of solution culture previously developed, the authors have determined the value of $(\text{NH}_4)_2\text{SO}_4$ for soy beans under a limited range of conditions comprising 20 of the 84 solutions of the Tottingham series. These have been contrasted with the corresponding Tottingham solutions unmodified, all with an osmotic concentration of 1 atmosphere. Incidentally the effect of the $(\text{NH}_4)_2\text{SO}_4$ on H-ion concentration and the use of iron in the forms of FeSO_4 and ferric phosphate have been tested. The cultures were continued for about 5 weeks. In general higher yields were obtained in the series with $(\text{NH}_4)_2\text{SO}_4$, and the data were consistent when ferric phosphate was the source of iron. With FeSO_4 higher yields were obtained with the $(\text{NH}_4)_2\text{SO}_4$ only when the iron salt was used at very great dilution, less than 0.25 mgm. per l. It is considered that either through its influence on H-ion concentration or on permeability the presence of the ammonium salt enables the plant to satisfy its iron requirements with a very small amount of the ferric phosphate, whereas the Tottingham solution requires the iron salt in increased quantity. Consistent with earlier results, it was found that the growth of soy beans in the Tottingham solution decreases the H-ion concentration of the solution, while their growth in the $(\text{NH}_4)_2\text{SO}_4$ -containing solution invariably increases the H-ion concentration, even when the initial pH values of the corresponding solutions were the same. The direction of the reaction is accordingly modified by the salt constituents present. In concentrations of 0.25 mgm. or greater of FeSO_4 per l. a toxic

condition developed which increased with the amount of iron present. The solutions giving maximum growth of tops and roots were within a narrow range of KNO_3 concentrations, but within much wider ranges in the proportions of other salts. In the presence of $(\text{NH}_4)_2\text{SO}_4$ the proportion of the calcium salt giving the best growth of tops and roots was much lower than that giving the highest yield in the standard Tottingham solution.—*B. M. Duggar.*

2933. KOSTYTSHEW, S., UND P. ELIASBERG. Über die Form der Kaliumverbindungen in lebenden Pflanzengeweben. [The nature of the potassium compounds in living plant tissues.] Zeitschr. Physiol. Chem. 111: 228-235. 1920.—All the K of plants can be extracted with cold water, leaving material which yields K free ash. Lead acetate and tannin precipitates were also found to contain no K. The results are held to indicate that K, though a necessary element, does not form non-dissociating compounds with the organic constituents of the protoplasm. However, dissociable compounds of K with proteins may form. Since extracts made before and after ashing yielded the same amount of K this was all present in the ionic form.—*Chas. A. Shull.*

2934. NÉMEC, A., UND V. KÁŠ. Studien über die physiologische Bedeutung des Titans im Pflanzenorganismus. [The physiological significance of titanium in plants.] Biochem. Zeitschr. 140: 583-590. 2 fig. 1923.—Increased crops were obtained by manuring *Sinapis alba*, *Pisum sativum*, and *Medicago sativa* with Ti as the insoluble sodium titanate and the soluble titanium sodium citrate. Ti absorption was increased, the highest yields corresponding with the greatest Ti content. P, Si, and Al increased and decreased with the Ti content. The Ca content increased with increasing applications, and the Fe content decreased. Fe was thought to be replaced by Ti.—*H. D. Hooker, Jr.*

2935. NEWTON, W. The nutrition of the potato plant with special reference to water cultures. Jour. Amer. Soc. Agron. 15: 392-399. 1923.—The potato plants have difficulty in securing an adequate supply of Ca from many solutions. It is supposed that the beneficial effects of omitting K may be due to the creation of more favorable conditions for the absorption of Ca.—*F. M. Schertz.*

2936. PFYL, B. Über die Alkalität der Asche von Lebensmitteln. I. Der Begriff der Aschenalkalinität und die Verfahren zu ihrer Ermittlung. [Alkalinity of ash of foodstuffs. I. The conception of ash-alkalinity and the means of its determination.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 43: 313-339. 1922.

2937. PRIANISCHNIKOW, D. Zur Frage über die Bedeutung des Calciums für die Pflanzen. [The significance of calcium for plants.] Ber. Deutsch. Bot. Ges. 41: 138-144. 1923.—The author reports 2 different groups of experiments. A. The effect of Ca salts on the root. For the normal development of the maize plant it is necessary not only to provide a well developed root system with Ca but all growing parts of the root should be directly surrounded with a solution containing Ca. B. The physiological antagonism of free acids and of Ca salts. For *Elodea canadensis* and red beet the results, which he also shows graphically, are: (1) weak solutions of salts of the bivalent metals Mg, Ba, Sr, and Ca in concentrations of 0.0005 up to 0.005 N increase the resistance of the cells to acids; (2) of the cations used Ca showed the strongest antagonism; (3) the monovalent cations Na and K at the above concentrations showed little or no antagonism to acids.—*Hally Jolivette Sax.*

2938. RIPPEL, A. Über die durch Mangan verursachte Eisenchlorose bei grünen Pflanzen. [Iron chlorosis of green plants produced by manganese.] Biochem. Zeitschr. 140: 315-323. 1923.—Mn in the form of soluble Mn salts produced chlorosis in barley plants grown in water culture. The chlorosis was cured by increasing the Fe supply. As the Fe content of chlorotic and green plants was the same, it is concluded that Mn did not interfere with Fe absorption but with the activity of Fe within the plant.—*H. D. Hooker, Jr.*

2939. RIPPEL, A. Über die Mobilisation der Mineralstoffe und des Stickstoffs aus Holz und Rinde beim frühjährlichen Austreiben. [The translocation of mineral elements and nitrogen from wood and bark during spring growth.] Biochem. Zeitschr. 135: 518-531. 1923.—During the first growth of spring, translocation of K, N, and P from the stem to the young shoots and leaves of *Sambucus nigra* was very marked. NoCa, S, or Cl was translocated, and only small amounts of Mg and Na. Conditions in the wood and bark were identical except that K increased in the wood. The bases are mobilized either as inorganic phos-

phates, as salts of organic acids, or in combination with some phytin-like substance. S occurred mainly as SO_4 . The relation between organic and inorganic phosphate remained constant, indicating a regeneration of inorganic from organic phosphate.—*H. D. Hooker, Jr.*

2940. SCOTT, E. KILBURN. Nitrates and ammonia from atmospheric nitrogen. *Jour. Royal Soc. Arts* 71: 859–876, 877–895. 1923.

2941. WINSLOW, C.-E. A., AND I. S. FALK. Studies on salt action. IX. The additive and antagonistic effects of sodium and calcium chlorides upon the viability of *Bact. coli*. *Jour. Bact.* 8: 237–244. 2 fig. 1923.—There are 2 types of toxicity due to action of salts. High salt concentrations are toxic at all reactions and the effect is additive when NaCl and CaCl_2 are mixed. When used in dilute solutions with alkaline suspensions of *B. coli*, CaCl_2 exerts a toxic effect. However, mixtures of 5 parts of NaCl to 1 part of CaCl_2 not only fail to show the toxic effect but exert a stimulating action. The 2nd sort of toxicity is due to an inhibition by CaCl_2 of the power of the bacteria to reduce the alkalinity of the medium in which they are suspended. NaCl prevents this action of CaCl_2 or neutralizes its effect.—*C. E. Skinner.*

PHOTOSYNTHESIS, CHLOROPHYLL

2942. BALY, E. C. C., I. M. HEILBRON, AND W. F. BARKER. Photochemical production of formaldehyde. *Nature* 112: 323. 1923.—Spoehr has stated (*Jour. Amer. Chem. Soc.* 45: 1184) that he has been unable to confirm certain of the writers' results. This article describes some details of the experiment. Allmand has shown that the straight form of the quartz mercury lamp may deteriorate with respect to ultra-violet wave production, and it is suggested that this may account for Spoehr's results.—*O. A. Stevens.*

2943. DIXON, H. H., AND N. G. BALL. Photosynthesis and the electronic theory (II). *Sci. Proc. Roy. Dublin Soc.* 16: No. 33. 1922? [See Bot. Absts. 11, Entry 4623.]

2944. LLOYD, FRANCIS E. Ultramicroscopically observable fluorescence. *Science* 58: 229–230. 1923.—The writer has found it possible to observe fluorescence in chloroplasts. They must be mounted in a solution of cane sugar or glycerine and illuminated by the apex of the inverted cone of illumination obtained by reflection from the cover glass. A better understanding of the behavior of fluorescent pigments is needed in view of the fact that they may all be catalysts in photosynthesis.—*C. J. Lyon.*

2945. LOEW, O. Über die Ernährung der autotrophen Bakterien. [The nutrition of autotrophic bacteria.] *Biochem. Zeitschr.* 140: 324–325. 1923.—Equations are given to represent the formation of formaldehyde from carbonic acid by autotrophic bacteria.—*H. D. Hooker, Jr.*

2946. MARCHLEWSKI, LEON. Chlorophylle et pigment du sang. (Etude sur la parenté chimique des colorants fondamentaux du monde végétal et du monde animal.) [Chlorophyll and hemoglobin. The chemical similarity of the fundamental coloring matters of the plant and animal world.] *Bull. Soc. Chim. Biol.* 4: 476–506. 1922.—A review of the author's previously published work in the chemistry of chlorophyll and hemoglobin, in which the identity of hemopyrrol with chlorophyllpyrrol and of the oxidation products of hematoporphyrin with those of phylloporphyrin is regarded as established.—*Joseph S. Caldwell.*

METABOLISM (GENERAL)

2947. ANDERSON, R. J. Composition of corn pollen. II. Concerning certain lipoids, a hydrocarbon, and phytosterol occurring in the pollen of white flint corn. *Jour. Biol. Chem.* 55: 611–627. 1923.—The following substances have been isolated from the alcoholic and ether extracts of corn pollen: (1) phytosterol palmitate; (2) other phytosterols; (3) a saturated hydrocarbon evidently identical with normal nonacosane ($\text{C}_{29}\text{H}_{60}$); (4) a saturated alcohol ($\text{C}_{30}\text{H}_{62}\text{O}$) which has not been identified; and (5) a phosphatide.—*G. B. Rigg.*

2948. ARMSTRONG, H. E. The occurrence of urease. *Nature* 112: 620–621. 1923.—Referring to the notes by E. A. WERNER [see Bot. Absts. 13, Entry 2086] and M. W. Beijerinck [see Bot. Absts. 13, Entry 3032] the writer calls attention to earlier reports by himself (*Ann. Bot.* 25:) and by Benjamin (*British Assoc. Rept.*, Australia, 1914).—*O. A. Stevens.*

2949. ATKINS, W. R. G. The hydrogen ion concentration of plant cells. *Sci. Proc. Roy. Dublin Soc.* 16: No. 31. 1922? [See Bot. Absts. 11, Entry 4626.]

2950. BARRENSCHEEN, H. K., UND H. A. BECKH-WIDMANSTETTER. *Über bakterielle Reduktion organisch gebundener Phosphorsäure.* [Bacterial reduction of organically combined phosphoric acid.] *Biochem. Zeitschr.* 140: 279-283. 1923.—Under anaerobic conditions bacteria were found that reduced organically combined phosphoric acid in blood. A positive Blondol-Dusart reaction was obtained. The nature of the bacteria was not determined.—*H. D. Hooker, Jr.*

2951. BEHRE, A., UND A. DÜRING. *Bestimmung von Saccharose bei Gegenwart von anderen Zuckerarten mittels der Erdalkalihydroxyde.* [Determination of saccharose in presence of other sugars by means of hydroxides of the alkaline earths.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 44: 65-70. 1922.

2952. BEZSSONOFF, N. *Sur les réactions colorées des extraits antiscorbutiques et des polyphénols avec un acid phosphomolybdotungstique.* [The color reactions of antiscorbutic extracts and polyphenols with phosphomolybdotungstic acid.] *Bull. Soc. Chim. Biol.* 4: 83-95. 1922.—The author employed a modification of Folin's reagent made by dissolving 44 gm. sodium tungstate and 2.7 gm. phosphomolybdic acid in 400 cc. distilled water and adding 5 cc. 85 per cent phosphoric acid and 60 cc. 5 *N* sulphuric acid. This mixture heated 2 hours on the water bath at 50-60°C. gives a reagent which can be kept in the dark for 6 weeks. It differs from Folin's reagent in that it does not give a blue coloration with mono-di, tri-, or poly phenols, with the exception of hydroquinone. It gives a blue coloration with the expressed juice of orange, lemon, peach, tomato, and grape and with that of potato tubers if acid is present. The color with the juice of prunes is a persistent yellowish brown. Attempts to determine the nature of the substance which gives the blue color led the author to confirm the conclusion of Wu (*Jour. Biol. Chem.* 43: 189-220. 1920) that there are 2 principal types of phosphomolybdotungstic acids differing in the ratio of $WO_3 + MoO_3$ to P_2O_5 present therein.—*Joseph S. Caldwell.*

2953. BOAS, F., AND F. MERKENSCHLAGER. *Über die Wirkung spezifischer Zuckerarten bei höheren Pflanzen.* [The effect of specific kinds of sugar on higher plants.] *Ber. Deutsch. Bot. Ges.* 41: 187-190. 1923.—The authors used *Lupinus luteus* for these experiments. Galactose proved to be most favorable to the development of the seedlings. Arabinose was second in this respect.—*Hally Jolivette Sax.*

2954. BRAECKE, MARIE. *Application de la méthode biochimique de Bourquelot à la recherche des sucres et des glucosides dans quelques plantes de la famille des Scrophulariacées.* [Application of Bourquelot's biochemical method to the study of the sugars and the glucosides of certain members of the Scrophulariaceae.] *Bull. Soc. Chim. Biol.* 4: 407-414. 1922.—The seeds of *Collinsia bicolor* Benth and *Pentstemon barbatus* Roth and the leafy shoots of *Freylinia cestoides* Colla contain a glucoside which is identical in its properties with aucubin, isolated from *Aucuba japonica* and several species of *Melampyrum*. The seeds of *Antirrhinum majus* L. and *Paulownia imperialis* Sieb. and Zucc. contain traces of a glucoside which is probably aucubin. The leafy shoots of *Halleria lucida* L., *Russelia juncea* Zucc., and *Bowkeria triphylla* Harv. contain a glucoside which does not have the characteristics of aucubin and which is apparently new.—*Joseph S. Caldwell.*

2955. BRAECKE, MARIE. *Sur la presence d'aucubine et de mannite dans les tiges foliées de Rhinanthus Crista-Galli L.* [Aucubin and mannite in leafy stalks of *Rhinanthus Crista-Galli*.] *Bull. Soc. Chim. Biol.* 5: 258-262. 1923.—Extending a previous investigation made in collaboration with Bridel [See Bot. Absts. 12, Entries 4490 and 5190] in which the seed of this species were shown to contain aucubin and saccharose, Miss Braecke has studied the glucoside content of plants collected in full flower and at the close of the flowering period. Aucubin was isolated in the pure state. The polyatomic alcohol present, which was discovered by Eichler in 1858 and which he thought to be melampyrite (dulcitol), was isolated and found to be mannite.—*Joseph S. Caldwell.*

2956. BRAECKE, MARIE. *Sur la présence d'aucubine et de mélampyrite dans plusieurs espèces de Melampyres.* [Aucubine and melampyrite in several species of *Melampyrum*.] *Bull. Soc. Chim. Biol.* 5: 207-215. 1923.—Continuing earlier studies of the glucoside of this genus [see Bot. Absts. 13, Entry 2958] the investigation has been extended to *Melampyrum pratense* L., *M. nemorosum* L., and *M. cristatum* L. Employing entire plants gathered at the

flowering stage. Aucubin was present in each of the 3 and was isolated in pure form. Melampyrite was isolated from *M. nemorosum*, from which it was originally prepared by Hünefeld in 1836, and also (for the 1st time) from *M. cristatum*. It is apparently not present in *M. pratense*, as it was not possible to crystallize it from the extract made from 5 kgm. of the plant.—*Joseph S. Caldwell.*

2957. BRIDEL, MARC. La synthese biochimique des hexobioses. [Biochemical synthesis of the hexobioses.] Bull. Soc. Chim. Biol. 4: 329-354. 1922.—A review is presented of the work of Croft Hill, Emmerling, Wroblewski, E. F. Armstrong, and Bourquelot and his pupils, dealing especially with the synthesis of gentiobiose and cellobiose by the latter.—*Joseph S. Caldwell.*

2958. BRIDEL, M. ET MARIE BRAECKE. Application de la méthode biochimique de Bourquelot aux tiges foliées et aux graines de *Melampyrum arvense*. [Application of Bourquelot's biochemical method to leafy shoots and seeds of *Melampyrum arvense*.] Bull. Soc. Chim. Biol. 4: 96-107. 1922.—The characteristic darkening of the plant during desiccation is due to the presence of a glucoside which is hydrolyzed by emulsin with the formation of an insoluble black precipitate. The glucoside was present in largest amount in old, nearly leafless, partially dried plants, hence does not appear to be utilized. The glucoside is extracted with boiling alcohol, treated with acetic ether, which removed melampyrite, and finally crystallized from a mixture of acetone and ether. The glucoside, which was also isolated from the dry seed, is identical in all its properties with aucubin, first isolated from *Aucuba japonica*, later from *Plantago* and *Garrya*. It was first studied in the seed of *Melampyrum* by Ludwig and Muller, who considered it identical with rhinanthin, isolated by Ludwig from the seed of *Rhinanthus Crista-Galli*. [See also Bot. Absts. 13, Entry 2956.]—*Joseph S. Caldwell.*

2959. BRIDEL, MARC, ET MARIE BRAECKE. Sur la présence d'aucubine et de saccharose dans les graines de *Rhinanthus Crista-Galli* L.—Rhinanthine et aucubine—la rhinanthine est de l'aucubine impure. [Aucubine and saccharose in seed of *Rhinanthus Crista-Galli*.—Rhinanthin is impure aucubine.] Bull. Soc. Chim. Biol. 5: 10-22. 1923.—Of the dry seed, 100 gm. contained 0.511 gm. reducing sugar, which was increased to 3.025 gm. by treatment with invertase, the alteration in optical rotation indicating that the increase was due to the hydrolysis of 2.3 88 gm. of saccharose. That this disaccharide was saccharose was proved by its isolation as a barium salt and subsequent crystallization. After the action of invertase had ceased, treatment with emulsin caused a further increase of reducing sugar to 4.939 gm., indicating an aucubin content of 3.416 gm. The glucoside was isolated by the method employed in the work with *Melampyrum* [see preceding abstract] and purified by successive crystallization from 98% acetone, 85% alcohol, 96% acetone, and a mixture of 85% alcohol and 96% acetone. It was identified by its optical rotation and by the characteristic aromatic odor of the products of H_2SO_4 hydrolysis. Its similarity in properties to the substance described as rhinanthin by Ludwig in 1868 led the authors to make a study of rhinanthin as described in the literature in comparison with aucubin. Ludwigs' material was a mixture of aucubin with varying amounts of saccharose and not a chemical entity; the name rhinanthin should therefore disappear from the literature.—*Joseph S. Caldwell.*

2960. BRUNSWIK, HERMANN. Der mikrochemische Nachweis pflanzlicher Blausäureverbindungen. Eine neue mikrochemische Methode zum Nachweis von Cyanwasserstoff und Emulsin. [The microchemical detection of compounds of HCN in plants. A new method for the detection of HCN and emulsin.] Sitzungsber. Akad. Wiss. Wien. (Math.-Nat. Kl.) Abt. I. 130: 383-435. 1 fig. 1921 [1923].—This is a comprehensive review of the distribution and character of cyanogenic compounds in plants, and a detailed presentation of methods for their microchemical detection, with particular reference to the so-called labile CN compounds, which are not recognizable as glucosides but which break down spontaneously and yield HCN. The existence of free HCN in normal plants is not credited; the appearance of this compound is held to be always due to enzymic activity, resulting from morbid changes.—The most successful microchemical methods for determining the presence of HCN are the reaction with $AgNO_3$ which yields crystals of $AgCN$, and the benzidine-copper acetate reaction which yields crystalline oxidation compounds of benzidine analogous to benzidine chromate. In the 1st reaction the crystals of $AgCN$ are distinguishable from those of $AgCl$ by their crystallo-

graphic properties but particularly by the use of certain organic dyes which these crystals characteristically absorb. A 1 per cent solution of AgNO_3 with methylene blue is recommended in practice. The benzidine-copper acetate reagent is prepared by mixing 1 cc. of 3 per cent copper acetate and 10 cc. of saturated benzidine acetate in aqueous solution with 16 cc. water; by its use needle-like, blue crystals, insoluble in water, are obtained. It is sensitive to 1 part of HCN in 3,000,000, but is not entirely specific, hence must be used in conjunction with AgNO_3 .—The occurrence of HCN was demonstrated in 12 species of *Ribes*, 5 of *Crataegus*, 14 species of the Araceae, and 10 of other plants, including ferns, in which the compound has not previously been reported. Plant material was prepared for investigation by placing sections or macerated tissue in a hanging drop for 10 hours with the addition of a little chloroform. It was possible to observe the decline in the amount of HCN from young buds to mature leaves, but the localization of HCN could not be satisfactorily studied, nor was any suitable microchemical test for cyanogenic glucosides as such found. HCN could also be detected in illuminating gas and tobacco smoke.—The same method was employed to determine the presence of emulsin. Finely divided plant material was added to a solution of amygdalin + toluol, and after exposure for 1 day at room temperature the test for HCN was applied. Emulsin was found in a large number of plants, even in some in which gross analytical methods had failed to detect it, and also in a number of small invertebrates. The activity of emulsin from different sources was studied somewhat quantitatively, and localization of the enzyme in certain organs or special cells was found to be a general rule.—*F. Weiss*.

2961. BRUNSWIK, HERMANN. Die Mikrochemie der Flavonexkrete bei den Primulinae. [The microchemistry of flavone excretions in the Primulinae.] Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. I. 131: 221-232. 1922 [1923].—The so-called farina covering the leaves of certain Primulas was shown by Müller to consist largely of a flavone together with small quantities of wax, but a study of the origin and microchemical behavior of the farina has not previously been made. Using Klein's microsublimation methods, the farina has been shown to be a flavone with the following properties: crystallizes from hot HCl in a characteristic way, forms bluish mixed crystals by treatment of its alcoholic solution with KI and also adsorbs iodine to form dark colored crystals, and gives a blue fluorescent solution with H_2SO_4 . The same flavone was found in the farina of 25 species of *Primula* out of 74 examined, and in 3 species of *Dionysia*. Extracts made from the druses of *Primula sinensis* and *Cortusa Matthioli* contained a flavone in solution, but the crystallizable substance which Nestler obtained from the former species and to which is attributed its irritating effect on the skin is not a flavone.—*F. Weiss*.

2962. CHARAUX, C. Sur la presence de l'aucubine dans les graines de *Veronica hederaefolia* L. [Aucubin in seeds of *Veronica hederaefolia*.] Bull. Soc. Chim. Biol. 4: 568-570. 1922.—Employing essentially the methods used by Bourquelot and Herissey in studying the seeds of *Aucuba japonica*, the author isolated and purified a glucoside identical in its properties with aucubin.—*Joseph S. Caldwell*.

2963. COLIN, H., ET H. BELVAL. Le titre acidimétrique et le pouvoir hydrolysant des sucres végétaux. [Acidimetric titration and the hydrolyzing power of vegetable saps.] Bull. Soc. Chim. Biol. 4: 165-170. 1922.—When a highly acid plant juice is boiled to destroy its enzymes, the saccharose present is only very slowly hydrolyzed by the acid present. The authors determined the sugar and acid content of orange, lemon, summer and winter sorrel, rhubarb, apple, and pear juices, and compared the rate of hydrolysis of saccharose in these juices, after heating to destroy enzymes, with that in pure saccharose solutions of equal concentration after addition of the appropriate acid (citric, oxalic, or malic) in concentration equal to that of the juice. In every case hydrolysis occurred much less rapidly in the fruit juices. The ash content of the various juices was then determined and the experiment was repeated, the rate of hydrolysis in boiled juice and in sugar-acid mixtures being checked against a series of sugar-acid mixtures to which an amount of the appropriate citrate, malate, tartrate, or oxalate—equal to that required to combine with the ash of the juice—had been added. To still another series of sugar-acid mixtures the ash derived from equivalent amounts of juice was added. The rate of hydrolysis after addition of acid salts, or of ash, is in every case greatly retarded by their presence. That hydrolysis of the saccharose of a fruit juice by the acids of the juice does not occur is due to the suppression of dissociation of the acid by the salts present.—*Joseph S. Caldwell*.

2964. COLLIP, J. B. **Glucokinin. A new hormone present in plant tissue. Preliminary paper.** Jour. Biol. Chem. 56: 513-543. 1923.—Extracts of yeast and also of onions, lettuce and wheat leaves, and other plant organs were used. When these extracts were subcutaneously injected into normal rabbits and depancreatized dogs, marked changes in sugar metabolism were produced. The name glucokinin is suggested for this new hormone from plant tissues. It seems probable that sugar metabolism is fundamentally similar in the plant and animal kingdoms.—*G. B. Rigg.*

2965. DAMON, S. R. **Some observations in regard to growth-promoting substances of bacterial origin.** Jour. Biol. Chem. 56: 895-902. 1923.—The dried bacteria were added to the food of young albino rats, the ration being free from vitamine B. Three of the varieties of bacteria tried induced rapid growth, while 2 did not. No explanation of the discordant results is suggested.—*G. B. Rigg.*

2966. EULER, H. VON, UND KARL MYRBÄCK. **Vitamine (Biokatalysatoren) B und Co-Enzyme. II. [Vitamin B (biocatalysts) and coenzyme. II.]** Zeitschr. Physiol Chem. 115: 115-169. 1 fig. 1921.—Using acceleration of CO₂ production by a standard yeast preparation as a measure of the vitamin B content of foods and excretions, an attempt is made to determine the vitamin balance for man. Inhibitory materials cause difficulties in making such determinations, but the preliminary results indicate that there is a considerable quantity of vitamin B used daily.—*Charles A. Shull.*

2967. FLEURY, PAUL, ET LOUIS BOUTOT. **Quelques observations sur la méthode de Folin et Wu et sa modification manganométrique pour le dosage de petites quantités de sucre réducteur. [The Folin-Wu method for the measurement of small amounts of sugar and its manganometric modification.]** Bull. Soc. Chim. Biol. 5: 148-152. 1923.—Comparative tests of the original method of Folin and Wu with the modification proposed by Fontes and Thivolle [see Bot. Absts. 13, Entry 2969] leads the authors to prefer the modified method. They emphasize the necessity for scrupulous exactness in the preparation of both test and standard solutions.—*Joseph S. Caldwell.*

2968. FLEURY, PAUL, ET GABRIEL POIROT. **Étude sur la réaction de l'orcine avec le furfural. Application au dosage colorimétrique de petites quantités de furfural. [The reaction of orcine with furfural. Application to colorimetric estimation of small amounts of furfural.]** Bull. Soc. Chim. Biol. 4: 251-266. 1922.—The authors first sought to ascertain the conditions under which a known quantity of furfural gives the most intense color. One part of furfural in 2,500,000 can be detected when 1 cc. of the solution containing furfural is heated for 1 minute in a boiling water-bath with 4 cc. glacial acetic acid containing 5 mg. orcin (1.24 gm. per l.) and 5 cc. HCl (sp. gr. 1.19) containing 0.2 cc. official ferric chloride per l. When removed from the bath and allowed to cool, the solution develops a greenish blue tint which gradually changes to pure blue, attaining maximum color in $\frac{1}{2}$ hour and diminishing after 1 hour. The error of the determination does not exceed 1 per cent when a column of liquid 10 cm. high is compared with simultaneously prepared standards containing known amounts of furfural, for amounts of furfural between 0.025 and 0.15 mgm. per l. Full directions for making the determination are given.—*Joseph S. Caldwell.*

2969. FONTES, G., ET L. THIVOLLE. **La molybdomanganimétrie et ses applications. 1re partie. Principes généraux. Dosage de cuivre. [Molybdomanganimetry and its applications. 1st part. General principles. Measurement of copper.]** Bull. Soc. Chim. Biol. 4: 614-622. 1922.—This is a method generally applicable in biology and of a high degree of accuracy.—*Joseph S. Caldwell.*

2970. FONTES, G., ET L. THIVOLLE. **La molybdomanganimétrie et ses applications. Deuxième partie. Microdosage de fer. Application au dosage du fer dans le sang. [Molybdomanganimetry and its applications. Micro-measurement of iron. Application to estimation of iron in blood.]** Bull. Soc. Chim. Biol. 5: 325-340. 1923.—The method, which is applicable to all biological fluids, is as follows: The Fe is precipitated by addition of several volumes of saturated picric acid solution or of a small amount of 4 per cent solution of nitrosobetanaphthol in glacial acetic acid. The precipitate is quickly filtered on a small ashless filter with suction, washed with cold water, the filter dried, incinerated, the iron oxide reduced in a current of H₂, transferred to a suitable vessel with 5-10 cc. of a special phosphomolybdic acid reagent, and the molybdenum blue titrated with permanganate. The method is accurate to 0.333 mgm. Fe.—*Joseph S. Caldwell.*

2971. FRANZEN, HARTWIG, UND EUGEN SCHUHMACHER. Über die chemischen Bestandteile grüner Pflanzen. XIV Mitteilung. Über die durch Bleiacetat fällbaren Säuren der Johannisbeeren (*Ribes rubrum*). [Chemical constituents of green plants. XIV. Acids of currants (*Ribes rubrum*) precipitable by lead acetate.] Zeitschr. Physiol. Chem. 115: 9-37. 1921.—Currants contain a large amount of citric and a small amount of malic acid, the amount of the former being about 47 times that of the latter. Tartaric acid is absent or present in traces only.—Charles A. Shull.

2972. FRANZEN, HARTWIG, UND EMMI STERN. Über die chemischen Bestandteile grüner Pflanzen. XV Mitteilung. Über das Vorkommen von Äthylidenmilchsäure in den Blättern der Himbeere (*Rubus Idaeus*). [Chemical constituents of green plants. XV. Occurrence of ethylidene lactic acid in the leaves of the raspberry (*Rubus Idaeus*).] Zeitschr. Physiol. Chem. 115: 270-283. 1921.—The leaves of the raspberry contain much ethylidene lactic acid. Although lactic acid has been reported from 14 other plants, the authors claim that only 4 of these have actually been demonstrated to contain it, namely, *Papaver somniferum*, *Agave Sisalana*, *Ricinus communis* seedlings, and fruits of *Tamarindus indica*.—Charles A. Shull.

2973. FRANZEN, HARTWIG, UND ERNST KEYSSNER. Über die chemischen Bestandteile grüner Pflanzen. XVII Mitteilung. Über das Vorkommen von Äthylidenmilchsäure in den Blättern der Brombeere (*Rubus fruticosus*). [Chemical constituents of green plants. XVII. Occurrence of ethylidene lactic acid in the leaves of the blackberry (*Rubus fruticosus*).] Zeitschr. Physiol. Chem. 116: 166-168. 1921.—The occurrence of ethylidene lactic acid in blackberry leaves was demonstrated by producing its zinc salt, and the benzyldine derivative of its hydrazide. Optical properties and melting points of the crystals were used in identifications.—Chas. A. Shull.

2974. FUJIWARA, K. Isolierungsversuche mit Soja-Agglutinin und Antiagglutinin. [Experiments on the isolation of soy-bean agglutinin and antiagglutinin.] Biochem. Zeitschr. 140: 113-131. 1923.—Soy-bean agglutinin was adsorbed by kaolin, aluminium hydroxide, and calcium phosphate, in proportion to the amount. Antiagglutinin was completely adsorbed from serum by the same substances. Adsorbed agglutinin was set free by weak ammonia and Na_2HPO_4 and to a much smaller extent by weak KH_2PO_4 or in the presence of an excess of adsorbent. The agglutinating activity was removed by a single boiling. Repeated injection of soy-bean extract in guinea pigs led to the formation of a specific antiagglutinin.—H. D. Hooker, Jr.

2975. FUNK, C., AND L. FREEDMAN. The presence of an yeast-growth-promoting vitamine in cane sugar. Jour. Biol. Chem. 56: 851-860. 1923.—The growth of yeast is dependent on 2 factors: the vitamin-like substance present in 1 or more of the ingredients making up the medium, such as cane-sugar; and the amount of vitamin carried over by the inoculation. Yeast cannot synthesize vitamin B in the absence of vitamin D since yeast cannot grow in the absence of the latter.—G. B. Rigg.

2976. GRÜSS, J. Die Oxydation des Ligninalkohols zu Ligninsäure und das Vorkommen der Ligninsäuren in der Natur. [The oxidation of lignin alcohol to lignin-acid and the occurrence of lignin-acid in nature.] Ber. Deutsch. Bot. Ges. 41: 53-58. 1923.

2977. GRÜSS, J. Über die Ligninsubstanz. [Lignin.] Ber. Deutsch. Bot. Ges. 41: 48-52. 1923.

2978. HARWOOD, FRANK COURTNEY. The colloidal electrolyte extracted from carrageen (*Chondrus crispus*). Jour. Chem. Soc. [London] 123: 2254-2258. 1923.—The mucilaginous substance extracted from carrageen or Irish moss by cold water has a constitutional formula corresponding either to $\text{R} \begin{pmatrix} \text{O} \cdot \text{SO}_2 \cdot \text{O} \\ \text{O} \cdot \text{SO}_2 \cdot \text{O} \end{pmatrix} \text{Ca}$ or to $\text{Ca}(\text{O} \cdot \text{SO}_2 \cdot \text{O} \cdot \text{R})_2$. It is strongly ionized in solution, the ions forming aggregates called micelles. It is proposed to use this substance for an investigation of the Donnan equilibrium and the Procter-Wilson theory of swelling.—F. E. Denny.

2979. HERZOG, R. O., UND F. BECK. Über die Auflösung von Zellulose in Salzen der Alkalien und Erdalkalien. [Solubility of cellulose in salts of alkali and alkaline earth metals.] Zeitschr. Physiol. Chem. 111: 287-292. 1920.—It is concluded that the solubility of cellulose

in concentrated salt solutions of this type is a function of the hydration of ions of the salts. The greater the hydration the greater the solubility. The hydration of anions and cations may be added in determining the solubility of cellulose in the salt. The hydration series are: $\text{NH}_4 < \text{K} < \text{Na} < \text{Li}; \text{Ba} < \text{Sr} < \text{Ca}; \text{SO}_4 < \text{Cl} < \text{Br} < \text{I} < \text{CNS}$. The solubility may depend on formation of complexes of cellulose, salt, and water.—*Chas. A. Skull*.

2980. HINSBERG, O., UND E. ROOS. *Berichtigungen zu einer Abhandlung über Hefefett*. [Corrections relating to yeast fat.] *Zeitschr. Physiol. Chem.* 111: 304. 1920.—The authors correct some statements made about their work by McLean and Thomas (see Bot. Absts. 7, Entry 1316).—*Chas. A. Skull*.

2981. JOLLES, ADOLPH. *Über die Bestimmung der Saccharose bei Gegenwart anderer Zuckerarten*. [Determination of saccharose in the presence of other sugars.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 44: 353–354. 1922.

2982. KLEIN, GUSTAV. *Der histochemische Nachweis der Flavone*. [Histochemical detection of flavones.] *Sitzungsber. Akad. Wiss. Wien. (Math.-Nat. Kl.) Abt. I.* 131: 23–46. 1 pl. 1922 [1923].—This describes a microchemical method for the recognition of flavones as a class, the analysis of these compounds having been previously dependent entirely on gross chemical methods. The method consists of exposing a section of fresh tissue, pulverized dry material, or drugs of plant origin to the vapor of any of the halogen acids, preferably HCl, in a microscopic cell at about 40°C. for 15–30 minutes. By this means oxy- or hydroxy-crystalline derivatives of flavones are produced; these are yellow in color and occur as single or aggregated needles or as dendrites and spherites, and appear precisely where the flavone was present. By further study of their crystallographic properties and their solubility and staining reactions with organic dyes the crystals may be assigned to a particular flavone or group. A tabular summary is given showing the distribution, quantity and kind of flavones present, and the crystallographic and staining properties of the acid crystal products for about 100 species of plants, among which there are 37 species in which flavones were previously not known.—*F. Weiss*.

2983. KOFLER, LUDWIG. *Zur Unterscheidung und quantitativen Bestimmung der Saponine*. [Differentiation and quantitative determination of saponins.] *Zeitschr. Untersuchung. Nahrungs- u. Genussmittel* 43: 278–287. 1922.—It is impossible to identify saponins in impure forms or in foodstuffs, etc., by ordinary methods. For the differentiation of single saponins hemolytic effect and foaming-power are used. The "foam-number" is obtained by shaking different concentrations and measuring the foam. The hemolytic index is obtained in the usual way. By division of the hemolytic index by the foam number a quotient is obtained which is independent of the purity of the saponin. Investigation of 6 different saponins yielded constants sufficiently diverse to be used as means of identification.—*E. E. Stanford*.

2984. KOGANEI, RYOICHI. *Studies on the acid proof staining property of cephalin*. *Jour. Biochem. Tokyo* 2: 495–503. 1923.—The acid-fast staining character of the fatty substances of tubercle bacilli has been shown to be due to the presence of cephalin [see Bot. Absts. 12, Entry 5947]. The author now finds that the staining of an ethereal solution of cephalin by fuchsin is due to the presence of traces of aminoethyl-alcohol compounds of fatty acids.—*Joseph S. Caldwell*.

2985. KOSTYTSCHEW, S. *Über Zuckerbildung aus Nichtzuckerstoffen durch Schimmelpilze*. [Formation of sugars from non-sugars by molds.] *Zeitschr. Physiol. Chem.* 111: 236–245. 1920.—*Aspergillus niger* was observed to form sugar and alcohol from such substances as *d*-tartaric acid, glycerol, quinic acid, mannite, and lactic acid; it was not able to form sugar from peptone.—*Chas. A. Skull*.

2986. LING, ARTHUR ROBERT, AND DINSHAW RATTONJI NANJI. *Studies on starch. Part I. The nature of polymerized amylose and of amylopectin*. *Jour. Chem. Soc. [London]* 123: 2666–2688. 4 fig. 1923.—The authors discuss earlier views regarding the structure of starch. Details are presented of experiments on the basis of which a different opinion was formulated in respect to the composition and structure of pure starch from several plants. Diagrams showing the linkings of groups of atoms within the molecules are given. Potato and arrowroot starch consist almost entirely of amylose and amylopectin; but barley, wheat, and rice starch contain, in addition, other carbohydrates which resemble hemicelluloses; these last, in some

samples of purified rice starch, amounting to as much as 18%. The ratio of amylose to amylopectin is 2:1 and is constant in the different starches. The authors give directions for separating amylose and amylopectin by physical, chemical, and biochemical methods. The products resulting from the splitting of starch by enzymes depend upon the method of preparing the enzyme; thus, a solution of freshly precipitated barley diastase hydrolyzes both amylose and amylopectin, but precipitated barley diastase, dehydrated by alcohol and dried, splits amylose without attacking amylopectin to any extent.—*F. E. Denny.*

2987. LUKASZEWICZ, JÓSEF. Przyczynek do mikrochemji włoska parzacego *Urtica dioica* L. [The microchemistry of the stinging hairs of *Urtica dioica*.] *Acta. Soc. Bot. Poloniae* 1: No. 3. (1-3). 1923.—A method is described for demonstrating the presence of the subcuticular pectic granules of Rouppert.—*J. R. Schramm.*

2988. MACDONALD, MARGARET B. The synthesis of "bios" by yeast grown in a solution of purified nutrients. *Jour. Biol. Chem.* 56: 489-499. 1923.—Three varieties of yeast were used: *Saccharomyces cerevisiae*, *S. ellipsoideus*, and yeast XII. There is an increased production of yeast in a sucrose-mineral salts medium to which alcohol or water extracts of these yeasts have been added. Similar effects were obtained by adding extracts of commercial yeasts, wheat germ, malt, peptone, Liebig's extract of beef, and autoclaved steak. Yeasts grown in a distilled water solution of pure sugar and nutrient salts serve to stimulate the growth of seedlings in such a medium. Apparently, under the experimental conditions described yeast synthesizes a substance which stimulates the growth of the culture to which it is added. This substance appears to be identical with the "bios" of Wildiers, and does not seem to function in the manner of a vitamin.—*G. B. Rigg.*

2989. MEVIUS, WALTER. Beiträge zur kenntnis der Farbstoffe und der Membranen von *Haematococcus pluvialis*. [Color materials and membranes of *Haematococcus pluvialis*.] *Ber. Deutsch. Bot. Ges.* 41: 237-242. 1923.—The author found that the red aplanospores of *Haematococcus pluvialis* contain 3 carotinoids—xanthophyll, carotin, and a 1-band hematochrome. The walls of the aplanospores consist of hemicellulose. It encrusts a material similar to cutin. The walls of the zoospores give no cellulose reaction. There is no pectin present in any of the stages.—*Hally Jolivet Sax.*

2990. MOUGNE, G. Sur un mode de préparation du galactose pur. [A method of preparing pure galactose.] *Bull. Soc. Chim. Biol.* 4: 206-208. 1922.—To 750 gm. lactose in 4,000 cc. distilled water, is added 60 cc. concentrated H_2SO_4 and the whole autoclaved 4 hours at 105-110°C. It is then neutralized with $CaCO_3$, diluted to 7,500 cc., 3 parts per 100 of top yeast are added, and the progress of the fermentation followed with the polarimeter until the rotation becomes that of galactose, which may require 20-24 hours. The liquid is filtered, brought to boiling, again filtered, and evaporated to dryness, dissolved in 75 per cent alcohol, and purified by repeated crystallization from alcohol. A yield of 160-180 gm. of galactose is obtained.—*Joseph S. Caldwell.*

2991. MURSCHAUSER, HANS. Drehungserscheinungen von Dextrose in Lösungen von tertiärem Natriumphosphate. Die Mutarotation als analytische Methode. [Rotatory power of dextrose in solution of tertiary sodium phosphate. Mutarotation as a method of analysis.] *Biochem. Zeitschr.* 117: 215-226. 1921.—Previously described methods were employed. In each measurement 5 gm. of dextrose was dissolved in 100 cc. of the Na_3PO_4 solution. The temperature was kept at 24.4°C. and the rotatory power was determined every 5 minutes until a constant rotation of $[\alpha]_D$ 52.5 was reached. $\frac{N}{500}$ Na_3PO_4 increased the velocity constant of

mutarotation to 99.5 as compared with 6.66 in distilled water. Increasing the concentration above $\frac{N}{500}$ caused the decrease in dextrorotation to go beyond the constant $[\alpha]_D$ 52.5. This

probably is due to changing the dextrose into levulose or other levo- or possibly weak dextro-rotatory compounds. Na_3PO_4 increases the velocity constant much more than Na_2HPO_4 . The writer states that, using the mutarotation of dextrose as a means of analysis, it is not only possible to determine the H-ion concentration of a solution but also to distinguish between Na_2HPO_4 and Na_3PO_4 , as well as to determine their proportions in a mixture of the 2, and even to identify any salt by this method. [See also *Bot. Absts.* 12, Entry 6628.]—*F. G. Gustafson.*

2992. OPPLER, BERTHOLD. *Berichtigung zu der Mittheilung Bd. 109. S. 57 (1920).* [A correction.] *Zeitschr. Physiol. Chem.* 111: 68. 1920.—A correction to the table cited in the title does not change the author's conclusions.—*Chas. A. Shull.*

2993. REMY, E. *Vergleichende Untersuchungen über weissen, gelben, roten und violetten Mais.* [Comparative investigations on white, yellow, red, and violet maize.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 44: 209-213. 1922.—Comparative analyses showed no essential difference in the values of different colored maize. The coloring matters of the red and violet varieties are said to be anthocyan derivatives; that of the yellow of flavone character.—*E. E. Stanford.*

2994. SALKOWSKI, E. *Zur Kenntnis des Xylans.* [Xylan.] *Zeitschr. Physiol. Chem.* 117: 48-60. 1921.—An improved method of preparing xylan is given, and the factor for estimating xylose for pure 0.1 per cent aqueous solutions, based upon the Fehling's reduction, is 0.5527, which differs slightly from that commonly used.—*Charles A. Shull.*

2995. SANDO, C. E. *Constituents of the wax-like coating of the surface of the apple.* *Jour. Biol. Chem.* 56: 457-468. 1923.—In the ether extract of the skins of Ben Davis and Black Ben Davis apples the following were found: triacontane ($C_{30}H_{62}$), heptacosanol ($C_{27}H_{56}O$), malol ($C_{30}H_{48}O_3$), a new crystalline alcohol, and some unidentified fractions apparently consisting of hydrocarbons or alcohols or mixtures of these substances.—*G. B. Rigg.*

2996. SHERMANN, H. C., AND HARRIET EDGEWORTH. *Experiments with two methods for the study of vitamin B.* *Jour. Amer. Chem. Soc.* 45: 2712-2718. 1923.—The authors use the term vitamin B to designate the growth-promoting, water-soluble B, without regard to whether this is or is not identical with the antineuritic substance.—The 2 methods used were the gravimetric method of determining the amounts of B in different food materials by the increase in the weight of yeast, and by the growth of young rats, rather than by the prevention or cure of polyneuritis in pigeons. The authors consider that the yeast method is open to the objection that other substances in a given food material will influence the growth of yeasts. Although the rat-growth method has the greater probable error it was considered the better because the results can be determined in terms of vitamin B with much greater certainty than by the yeast method.—*J. M. Brannon.*

2997. SHOHL, A. T. *Analysis of the Jerusalem artichoke.* *Jour. Amer. Chem. Soc.* 45: 2754-2756. 1923.—The Jerusalem artichoke contains 15.5 per cent of inulin; 71.1 per cent of the total N is water soluble. It contains a small amount of the water soluble vitamin. The author suggests that this plant might be of value in the treatment of diabetes.—*J. M. Brannon.*

2998. SIMONNET, H. *La question des vitamines. I. Le facteur lipo-soluble.* [The vitamin question. I. The fat soluble factor.] *Bull. Soc. Chem. Biol.* 5: 538-689. 1923.—This is a comprehensive résumé of the literature. The section and chapter headings are as follows: Part I. The reactive animal. (1) Composition and preparation of dietaries deficient in factor A. (2) The effects of such dietaries on growth and maintenance; lesions and disorders; effects upon reproduction; effects upon various animal species. (3) Methods of study.—Part II. The fat-soluble factor. (1) Its chemical nature and properties. (2) Its distribution. The bibliography of 224 titles is especially full as regards English and American works.—*Joseph S. Caldwell.*

2999. SMEDLEY-MACLEAN, IDA. *Bemerkungen über die Natur des Hefefetts.* [The nature of yeast fat.] *Zeitschr. Physiol. Chem.* 114: 199-200. 1921.—This is a reply to the criticism of Hinsberg and Roos [See Bot. Absts. 13, Entry 2980].—*Chas. A. Shull.*

3000. STEENBOCK, H., MARIANA T. SELL, AND J. H. JONES. *Fat-soluble vitamine. XII. The fat-soluble vitamine content of millets.* *Jour. Biol. Chem.* 56: 345-354. 1923.—Millets are not uniformly rich in fat-soluble vitamin. It is questionable whether the assumption that millets occupy a unique position among grains with respect to their content of the fat-soluble vitamin is correct. Among the millets, fat-soluble vitamin content does not appear to bear any definite relation to total yellow pigment.—*G. B. Rigg.*

3001. TADOKORO, TETSUTARO, AND YUKIHIKO NAKAMURA. *On some new derivatives of the fucose.* *Jour. Biochem. Tokyo* 2: 461-471. 1923.—Fucose was isolated from *Pelvetia Wrightii* Yendo. Employing the methods developed by other investigators in the preparation of derivatives of rhamnose, the authors prepared fucose-tetra-acetate, trifucose nitrate, methyl fucoside, and acetone fucoside. The melting points, optical rotation, and solubility in common reagents was determined for each of these derivatives.—*Joseph S. Caldwell.*

3002. TERROINE, EMILE F., ET J. E. LOBSTEIN. La formation des substances grasses et lipidiques. I. Influence de la nature des aliments hydrocarbonés sur la teneur en substances grasses du bacille tuberculeux et les caracteres de ces substances. [Formation of fatty and lipid materials. I. Influence of the nature of the hydrocarbons of the medium on the nature and quantity of fatty compounds of tubercle bacilli.] Bull. Soc. Chim. Biol. 5: 182-199. 1923.—The question whether quantitative and qualitative variation in the fatty substances of tubercle bacilli results from modifying the nature of the carbohydrate in otherwise identical culture media is attacked by substituting equivalent amounts of glycerol for anhydrous dextrose in the culture medium. Two strains of the human tubercle bacillus were employed, 1 virulent and 1 avirulent, and determinations of fatty materials were made by Lemeland's modification of the Kumagawa-Suto method (Bull. Soc. Chim. Biol. 3: 134-1921 and 4: 300, 1922) upon cultures grown 20-50 days at 37°C. The dry weight of cultures supplied with dextrose was very much the larger. Of the total lipoids, 90-92% were extractable by 20-hours extraction with boiling alcohol in the case of cultures with glycerol, but only 80-85% in the case of dextrose cultures. The lipid content of both human and bovine types grown on dextrose is approximately 40% of that of those on glycerol, the cholesterol content showing a corresponding difference and bearing a quite constant ratio to the total lipoids. The unsaponifiable fraction is highly variable. Cultures on glycerol had a slightly higher content of unsaturated fatty acids, but the melting points of the fats were identical for the 2 media. The protein content ($N \times 6.25$) of cultures was 11.6% of the fresh weight on glucose, 8% on glycerol.—Joseph S. Caldwell.

3003. THANNHAUSER, S. J., AND P. SACHS. Berichtigung zur X Mitteilung. [Correction to contribution X.] Zeitschr. Physiol. Chem. 114: 204. 1921.

3004. VERZÁR, F., J. NÁBRÁČKY, UND V. SZÁNYI. Die Stoffwechsel-Regulation durch Säure bei *Bac. coli* comm. [The regulation of metabolism by acid in *Bacterium coli communis*.] Biochem. Zeitschr. 141: 13-19. 4 fig. 1923.—When *Bacterium coli communis* was grown in 1% glucose bouillon containing a small amount of buffer, the culture attained a pH value of 4.08. This was also the case in 3% glucose bouillon irrespective of the buffer content. The amount of acid formed depended on the time required to reach pH 4.08, at which H-ion concentration acid formation ceased. This end point was reached whenever the sugar supply was sufficient to permit the formation of enough acid to combine with the buffer material.—H. D. Hooker, Jr.

3005. WURDACK, MARY E. Chemical composition of the walls of certain algae. Ohio Jour. Sci. 23: 181-191. 1923.—The cell walls of *Vaucheria geminata* are composed of an outer layer of pectose and an inner layer of cellulose. Mature oospores have an additional outer layer (chitin?). Cell walls of *Cladophora glomerata* are composed of 3 layers: chitin, pectose, and cellulose. Young filaments of *Oedogonium irregulare* have an outer layer of chitin and an inner layer of pectose. Older filaments show a 3rd inner layer of cellulose. The striated cell walls of *Oedogonium crassum amplum* have an unidentified outer layer, a middle layer of pectose, and an inner layer of cellulose. *Spirogyra fluviatilis* and 4 other species of *Spirogyra* have pectose outside and cellulose inside. In conjugation tubes the wall is at first a single layer of pectose, the cellulose being added later. Filaments of *Zygnema cruciatum* are enclosed in a sheath of pectic acid; inside this is a layer of pectose with cellulose on the inside. The sheath of *Draparnaldia plumosa* contains both pectic acid and pectose. The cell wall proper has an outer layer of pectose and an inner layer of cellulose. The sheath of *Tetraspora* is composed of pectic acid. Cellulose was identified by double refraction, solubility in cuprammonia, and blue color with iodine and H_2SO_4 . Pectic acid was identified by single refraction in polarized light, and solubility in dilute alkali. Pectose was determined by the solubilities of the products of acid digestion. Chitin was detected by single refraction and the chitosan reaction. Chitin and in some cases pectic substances prevented the entrance of copper and iodine into the cell.—H. D. Hooker, Jr.

3006. ZELLNER, JULIUS. Über den Milchsaft von *Lactarius vellereus* Fr. [The latex of *Lactarius vellereus* Fr.] Zeitschr. Physiol. Chem. 111: 293-296. 1920.—The latex is an emulsion of stearic acid and resin in an aqueous solution of proteins and carbohydrates. It contains water, 80.5%; stearic acid and resin, 14.65%; and small quantities of mannite, dextrose, mineral salts, and proteins.—Chas. A. Shull.

METABOLISM (NITROGEN RELATIONS)

3007. ARAI, MINORU. Über den bakteriellen Abbau des 1-Leucins. [On the bacterial decomposition of 1-leucine.] *Biochem. Zeitschr.* 122: 251-257. 1921.—When 1-leucine is added to a nutrient solution, *Proteus vulgaris* and *Bacillus subtilis* will transform it to leucinic acid. *P. vulgaris* will also form isoamylamine from 1-leucine.—*F. G. Gustafson.*

3008. CHIBNALL, ALBERT CHARLES. Diurnal variations in the total nitrogen content of foliage leaves. *Ann. Botany* 37: 511-519. 1923.—This paper is a discussion of the accuracy of methods used to compare the total N of leaves in the daytime with that of leaves at night, and from this to draw inferences regarding N metabolism. The methods are those in which total N is expressed as (A) weight in terms of a certain number of leaves, (B) percentage of dry leaf-weight, and (C) percentage of fresh leaf-weight. Experiments showed that the probable error of method B was the lowest and of method A much the highest. But method B cannot be used to measure accurately true diurnal change because of the translocation of other solids as well. For example if there is a percentage fall in total N less than that of total solids, the percentage of N on the dry weight basis will actually appear as a rise. In regard to method C, the water content must be considered, but evidence is presented to show that the diurnal variation in water content is extremely small, and with water making up 80-90% of the total weight of fresh leaves, it is concluded that method C is the best to adopt as a working basis. The data of several previous investigators are then considered from this point of view, and the conclusion is reached that there is in general a withdrawal of N from leaves at night.—*W. P. Thompson.*

3009. ENGELAND, R. Über die freien Aminogruppen der Eiweisskörper. [The free amino groups of the proteins.] *Zeitschr. Physiol. Chem.* 116: 226-227. 1921.—This is criticism of Edlbacher's work (*Zeitschr. Physiol. Chem.* 112: 80-85. 1921) pointing out that hydrolysis of proteins may occur during alkaline methylation, and that peptid proteins may not behave the same as free amino acids.—*Chas. A. Shull.*

3010. FULMER, ELLIS I. The utilization of atmospheric nitrogen by *Saccharomyces cerevisiae*. *Science* 57: 645-646. 1923.—Yeast grown in a medium composed of sugar and 1 salt, K_2HPO_4 , free from nitrogen, grows well and seems to use atmospheric nitrogen as the sole source of that element.—*C. J. Lyon.*

3011. GERICKE, W. F. Differences effected in the protein content of grain by application of nitrogen made at different growing periods of the plants. *Soil Sci.* 14: 103-109. 1922.—During growth the later nitrates were applied to soft and spring wheat, oats, or rye the higher the per cent of protein. Variations in the time of applying nitrates to a hard winter wheat produced little difference in the per cent of protein in the grain.—*W. J. Robbins.*

3012. GERUM, J., UND CHR. METZER. Zur Kenntnis des Weizenklebers. [A study of wheat gluten.] *Zeitschr. Untersuch. Nahrungs- u. Genussmittel* 44: 86-89. 1922.—This is a preliminary paper concerned chiefly with loss of phosphoric acid during gluten preparation.—*E. E. Stanford.*

3013. HERZIG, J., UND HANS LIEB. Über die Desaminoproteine. [Deaminoproteins.] *Zeitschr. Physiol. Chem.* 117: 1-12. 1921.—The methylation of deaminoproteins with diazomethane is described, and the authors have applied the Van Slyke and Sørensen amino-nitrogen methods to gluten, ovalbumin, casein, and gliadin, and their deaminoderivatives. The percentage of amino nitrogen is about the same in each pair of compounds.—*Chas. A. Shull.*

3014. JONES, D. B., AND C. E. F. GERSDORF. Proteins of the cantaloupe seed (*Cucumis melo*). Isolation of a crystalline globulin, and a comparative study of this globulin with the crystalline globulin of squash seed (*Cucurbita maxima*.) *Jour. Biol. Chem.* 56: 79-96. 1923.—Two proteins, a globulin and a glutelin, have been isolated from cantaloupe seed and analyzed. The globulin is identical in physical and chemical properties with the globulin of the squash seed. Anaphylaxis experiments on guinea pigs showed that these 2 proteins can not be distinguished immunologically; but these facts do not furnish conclusive evidence that the 2 proteins are identical.—*G. B. Rigg.*

3015. JONES, W., AND M. E. PERKINS. The nucleotides formed by the action of boiled pancreas on yeast nucleic acid. *Jour. Biol. Chem.* 55: 557-565. 1923.—A means has been found of decomposing nucleic acid quantitatively and this decomposition produces acidity

titratable with phenolphthalein. This indicates that 1 or more of the nucleotide linkages of nucleic acid bind a carbohydrate group to a phosphoric acid group. A formula for nucleic acid is suggested.—*G. B. Rigg.*

3016. MEISENHEIMER, JAKOB. Die stickstoffhaltigen Bestandteile der Hefe. II. Die Purinbasen und Diaminosäuren Ergebnisse. [Nitrogenous components of yeast. II. The purine bases and diamino acids.] *Zeitschr. Physiol Chem.* 114: 205-249. 1921.—The nitrogenous constituents of yeast are distributed as follows: ammonia nitrogen 8%; purine and pyrimidine bases, 12%; diamino acids, 20%; monoamino acids, 60%. Details of the N fractions within these groups are given.—*Chas. A. Shull.*

3017. NIKLEWSKI, BRONISLAW. Diminution du taux de l'azote dans le fumier sous l'influence des bactéries nitrifiantes. [Diminution in proportion of nitrogen in manure under the influence of nitrifying bacteria.] *Bull. Soc. Chim. Biol.* 5: 491-501. 1923.—In manure allowed to remain in stables, the constant addition of urine by the animals inhibits the development of nitrifying bacteria. When manure is stored in pits for some time, nitrifying bacteria become very numerous. The possibility that nitrifying bacteria may derive the necessary energy from the oxidation of ammonia was investigated by determinations of nitrites, nitrites, and ammonia in mineral culture media to which sterile manure had been added. The cultures were then inoculated with nitrifying bacteria and after 41 days compared with uninoculated checks. In the checks nitrates and nitrites were absent and ammonia was present, the total N present being 141 mgm., while the uninoculated cultures were free from nitrates, nitrites, and ammonia, the total N being reduced to 65 mgm. In samples of manure with added urine kept in glass vessels for 1 year, those inoculated with nitrifying bacteria showed losses of N 3-8 times as great as those occurring in checks not inoculated, the loss being greater in those samples to which smaller amounts of urine had been added. The results are considered to prove that in the presence of relatively large amounts of decomposable organic matter, nitrifying bacteria oxidize ammonia, the products of oxidation subsequently undergoing destruction by denitrifying bacteria. The data are of practical interest as indicating the best methods of conserving the nitrogen of manure. A bibliography of 27 titles is appended.—*Joseph S. Caldwell.*

3018. PRATJE, ANDRE. Die Chemie des Zellkernes. [The chemistry of the cell nucleus.] *Biol. Centralbl.* 40: 88-112. 1920.—This is a critical discussion of the availability of staining reactions and microchemical tests for the study of the nucleo proteins in the nuclei of plant and animal cells. There is no single method, free from criticism, which might be used to bring us nearer to a solution of the problem regarding the structure and closer localisation of the nucleo-proteins in nuclei.—*F. A. Abegg.*

3019. RIPPEL, AUGUST. Die Frage der Eiweisswanderung beim herbstlichen Vergilben der Laubblätter, [The question as to the disappearance of protein substances from foliage leaves with the onset of autumnal yellowing.] *Biol. Centralbl.* 41: 508-523. 1921.—Data based on the author's work and that of other investigators are presented to support the conclusion that the disappearance of N (chiefly proteins) from the leaf as autumn coloring sets in is not a mechanical process due to leaching by rain and dew, since even the most soluble inorganic substances (Ca, S, Cl) increase during this period. The percentage relations of the total N appropriated during the period of shoot development in spring and in the process of digestion of foliage by domestic animals (the resorption coefficient) corresponds so closely with the amounts of N translocated during the period of autumn coloring as to warrant the conclusion that the disappearance of N during this period is due to normal metabolic processes. It is probably the ergastic, chloroplast protein which is chiefly concerned.—The reduction in N content of leaves does not suddenly begin with the onset of yellowing but is initiated earlier and continues with the progressive aging of the leaf. The sudden drop at this period is due to the cessation of N fixation incident to the break down of the chloroplasts, while since the tissues remain alive removal goes on at the normal rate.—The sudden stoppage of protein synthesis may be caused by a variety of external factors.—*William L. Bray.*

3020. SCHENCK, MARTIN. Bemerkungen zu der Arbeit von J. Meisenheimer: "Die stickstoffhaltigen Bestandteile der Hefe." [Remarks on the work of J. Meisenheimer: The nitrogenous constituents of yeasts.] *Zeitschr. Physiol Chem.* 116: 308-310. 1921.—This is in reply to Meisenheimer (*Zeitschr. Physiol. Chem.* 114: 205-249. 1921), whose results were at some points in disagreement with Schenck's previous work.—*Chas. A. Shull.*

3021. STEUDEL, H., UND E. PEISER. Über die Hefenucleinsäure. II. [Yeast nucleic acid II.] Zeitschr. Physiol. Chem. 114: 201-203. 1921.—Yeast nucleic acid obtained from Böhringer und Sohne, Mannheim, contains 12 to 14% guanylic acid. This is a more convenient source for the preparation of guanylic acid than the pancreas preparations formerly used.—Chas. A. Shull.

3022. STEUDEL, H., UND E. PEISER. Über eine neue Spaltungsmethode der Nucleinsäure. [A new method of decomposing nucleic acid.] Zeitschr. Physiol. Chem. 111: 297-303. 1920.—Sodium nucleate, treated with calcium acid sulphite, is hydrolyzed, and the products can be precipitated by use of calcium acetate. Purification by reprecipitation was successful. The main product of this reaction is thymic acid, from which thymine can be prepared by H_2SO_4 hydrolysis. This cleavage gives a relatively simple and easy method of preparing thymic acid, which has been considered difficult to prepare. The acid prepared in this way is relatively stable, and can be kept a year or more without loss of its properties.—Chas. A. Shull.

3023. TODA, SHIGERU. Beiträge zum biologischen Studium der organischen Basen. I. Über die organischen Basen in normalen Menschenharn. [The biological study of organic bases. I. The organic bases in normal human urine.] Jour. Biochem. Tokyo 2: 417-423. 1923.—The methods of isolation and identification of organic bases described in this paper are employed in subsequent work on plant material [see following abstract].—Joseph S. Caldwell.

3024. TODA, SHIGERU. Beiträge zum biologischen Studium der organischen Basen II. über die organischen Basen in Extraktivstoffe aus pflanzlichen und tierischen Nahrungstoffen. Zweite Mitteilung. [A biological study of organic bases. II. The organic bases in extractives of food stuffs of plant and animal origin.] Jour. Biochem. Tokyo 2: 429-432. 1923.—Young shoots of *Pteris aquilina* were examined. Betaine was isolated, with traces of another base which was probably choline, and a 3rd which was too small in amount to permit of identification.—Joseph S. Caldwell.

3025. TODA, SHIGERU. Beiträge zum biologischen Studium der organischen Basen. II. Über die organischen Basen in Extraktivstoffe aus pflanzlichen und tierischen Nahrungstoffen. Dritte Mitteilung. [The biological study of the organic bases II. The organic bases in extractives of food stuffs of plant and animal origin.] Jour. Biochem. Tokyo 2: 433-436. 1923.—Stachydrin (prolinbetaine) was isolated from *Porphyrha laciniata* by the method of separation described in the author's earlier paper [see 2 preceding abstracts]. Preparations such as the chloraurate had the crystalline form and melting point of stachydrinchloraurate and gave the pyrrol reaction, but the results of combustion do not agree very closely with the theoretical values.—Joseph S. Caldwell.

3026. VICKERY, H. B. A product of mild acid hydrolysis of wheat gliadin. Jour. Biol. Chem. 56: 415-428. 1923.

3027. WILLAMAN, J. J., AND A. G. OLSEN. The bios requirement of bakers' yeast. Jour. Biol. Chem. 55: 815-836. 1923.—Bios is not identical with the water-soluble B vitamin. Normal growth of yeast is impossible without bios, and bios is in the nature of a vitamin. Bios may not function directly in growth but through assisting in the work of the cell enzymes.—G. B. Rigg.

3028. WINTERSTEIN, E., UND D. IATRIDES. Über das aus *Taxus baccata*, Eibe, darstellbare Alkaloid, Taxin. [The alkaloid, taxin, obtainable from the yew, *Taxus baccata*.] Zeitschr. Physiol. Chem. 117: 240-283. 5 fig. 1921.—From 0.7 to 1.4% of taxin occurs in the needles of both sexes of the yew. The formula for the alkaloid is $C_{37}H_{61}O_{10}N$. Neither the alkaloid nor its salts as at present prepared are crystallizable. With dilute acids it decomposes into a brownish resinous body, a reducing substance, and cinnamic and acetic acids. On reduction it combines with 2 molecules of H, indicating 2 double bonds. Other reactions are described, and the physiological effects of subcutaneous injections are also given. It is a heart poison, and the lethal dose for a rabbit is 0.024 gm. per kgm. body weight.—Charles A. Shull.

METABOLISM (ENZYMES, FERMENTATION)

3029. ACKLIN, O. Die Rolle der Bakterien bei der "Milchsäuregärung der Glukose durch Peptone." II. [The relation of bacteria to the "lactic acid fermentation of glucose by peptone." Biochem. Zeitschr. 141: 70-84. 1923.—Peptone induces lactic acid fermentation only when

contaminated by bacteria which produce a saccharolytic enzyme when grown in glucose media, and particularly in glucose, peptone and sodium bicarbonate at 37°C. Different bacteria were found in different peptones, and in consequence different types of fermentation were produced. Varieties with saccharolytic properties predominated, but others were present which had only proteolytic enzymes.—*H. D. Hooker, Jr.*

3030. BAU, A. *Bemerkungen zu der Abhandlung von Emil Baur und Eugen Herzfeld: "Über Gärung ohne Hefe."* [Remarks on the paper of Emil Baur and Eugen Herzfeld: "On fermentation without yeast."] *Biochem. Zeitschr.* 122: 303-306. 1921.—Bau criticizes the methods and believes the fermentation was brought about by bacteria in the peptone. [See also following entry.]—*F. G. Gustafson.*

3031. BAUR, EMIL, UND EUGENE HERZFELD. *Über Gärung ohne Hefe.* [Fermentation without yeast.] *Biochem. Zeitschr.* 117: 96-112. 1921.—Alcoholic fermentation takes place in a solution of alkali bile salt, peptone, sodium bicarbonate and dextrose. The addition of lipid increases the reaction somewhat.—*F. G. Gustafson.*

3032. BEIJERINCK, M. W. *Urease as a product of Bacterium radicola.* *Nature* 112: 439. 1923.—The writer adds to the note by E. A. WERNER [see *Bot. Absts.* 13, Entry 2086] the comment that urease is produced much more profusely by this organism in pure cultures than by nodules. The method of demonstration is described.—*O. A. Stevens.*

3033. BRUNKOW, O. R., W. H. PETERSON, AND E. B. FRED. *The influence of certain factors upon the chemical composition of sauerkraut.* *Jour. Amer. Chem. Soc.* 43: 2244-2255. 1921.—The authors show that inoculation with certain organisms produces a better grade of sauerkraut than is produced by natural fermentation. *Bacillus acidii* consistently gave the best results. When yeasts are present undesirable flavors develop and at times a reddish color appears. The best sauerkraut was produced when approximately 2 per cent of salt was used, but when 3 per cent salt was added the sauerkraut was tough. The chief products of sauerkraut fermentation are lactic acid, acetic acid, and ethyl alcohol. When certain organisms are present mannitol may be produced. The same products are produced in natural fermentation but the relative amounts can be influenced by inoculation.—*J. M. Brannon.*

3034. COLIN, H., ET Mlle. A. CHAUDUN. *Loi d'action de la sucrase: viscosité et vitesse de réaction.* [The law of action of sucrase: viscosity and velocity of reaction.] *Bull. Soc. Chim. Biol.* 4: 272-278. 1922.—The rate of hydrolysis of saccharose by sucrase depends solely upon the relative concentration of sugar and enzyme, but increase in viscosity due to increase in the concentration of sugar present retards the hydrolysis. Inversion is ultimately completed at a slower rate even in the presence of large amounts of such a viscous substance as glycerine. The same statements hold true when saccharose is inverted by mineral acids.—*Joseph S. Caldwell.*

3035. ERNSTRÖM, E. *Über die Abhängigkeit der Temperaturempfindlichkeit der Malzamy-lase von der Acidität.* [The relation of the thermal sensitivity of malt amylase to acidity.] *Biochem. Zeitschr.* 141: 40-41. 1 fig. 1923.—Malt amylase showed greatest stability at pH 5.2. A curve is plotted showing the relation between H-ion concentration and relative reaction velocity.—*H. D. Hooker, Jr.*

3036. EULER, H. VON, UND KARL MYRBÄCK. *Zur Kenntnis der Trockenhefe.* [Dried yeasts.] *Zeitschr. Physiol. Chem.* 117: 28-40. 1 fig. 1921.—This reports a study of the activity of dried yeasts under various conditions and treatments. The greatest activity of 1 gm. of dried yeast that could be induced by adding 2 per cent phosphate solution and various amounts of yeast extract was obtained when the extract from 8 gm. of yeast was used.—*Chas. A. Shull.*

3037. EULER, HANS VON, UND FOLKE NORDLUND. *Über die enzymatische Synthese des Fructose-Zymophosphates.* [Enzymatic synthesis of fructose-zymophosphate.] *Zeitschr. Physiol. Chem.* 116: 229-244. 1 fig. 1921.—The optimum acidity for enzymatic formation of zymophosphate by bottom yeasts was pH 6.4 for several sugars tested, but apparently not for fructose and glucose. The optimum lies within the range for most active CO₂ production, but is much less acid than the optimum for invertase action (pH 4).—*Chas. A. Shull.*

3038. EULER, H. VON, UND OLOF SVANBERG. *Nachtrag zu unserer Mitteilung: Über die Charakterisierung von Amylaselösungen.* [Supplement to our contribution: Characterization of amylase solutions.] *Zeitschr. Physiol. Chem.* 115: 179. 1921.

3039. EULER, H. VON, UND OLOF SVANBERG. Über die Charakterisierung von Amylase-lösungen. Vorläufige Mitteilung. [Characterization of amylase solutions. Preliminary report.] Zeitschr. Physiol. Chem. 112: 193-230. Fig. 1-7. 1921.—A formula is given for comparing the activity of different amylase solutions, as follows: $Sf = \frac{k \text{ gm. maltose}}{\text{gm. enzyme}}$ in which Sf is the sugar producing power per gm., and k the average value of the velocity constant of the monomolecular reaction. The optimal acidity for amylase is given as pH5.—Chas. A. Shull.

3040. FREUDENBERG, KARL, UND ERICH VOLBRECHT. Zum Kenntnis der Tannase. [Tannase.] Zeitschr. Physiol. Chem. 116: 277-292. Fig. 1-3. 1921.—The authors report a method for the quantitative estimation of tannase; also its preparation from *Aspergillus niger* grown on tannin, and the usual yield.—Chas. A. Shull.

3041. GOTTSCHALK, A. Über die carboxylatische Spaltung der Brenztraubensäure im Sauerstoffstrom. [Carboxylase cleavage of pyrotartaric acid in a stream of oxygen.] Biochem. Zeitschr. 140: 348-352. 1923.—Acetaldehyde was produced from pyrotartaric acid by yeast fermentation in a stream of O_2 . The amounts produced were in some cases greater than under ordinary fermentation conditions.—H. D. Hooker, Jr.

3042. HAGIHARA, J. Über Bakterienkatalase. IV. [Catalase from bacteria.] Biochem. Zeitschr. 140: 171-174. 1923.—Catalase from *Proteus* bacteria was purified by solution in water and precipitation with methyl alcohol. Purification increased the catalase activity 20-30 times and reduced the percentage of amino and ammonia N, though the total N content remained constant on the ash-free basis.—H. D. Hooker, Jr.

3043. HELFERICH, BURKHARDT. Über Emulsin. [Emulsin.] Zeitschr. Physiol. Chem. 117: 159-171. 1 fig. 1921.—A method of preparing emulsin from the seed of the plum is described, in which long extraction with water under toluol is used. Precipitation from dilute solution produces a better preparation, and dialysis is used for purification. The properties of the β -glucosides in emulsin are described.—Charles A. Shull.

3044. HERRISSEY, H. Synthèse biochimique du methyl-d-mannoside-a. [Biochemical synthesis of methyl-d-mannoside-a.] Bull. Soc. Chim. Biol. 4: 80-82. 1922.—An aqueous solution containing 941 mgm. mannose, 10 gm. 99.5% methyl alcohol, and 7.6 gm dried germinated alfalfa seed per 100 cc. was kept under toluol for 125 days. Polarimetric determination of mannose at the end of this time indicated that 336 mgm. had been transformed. Methyl-d-mannoside-a was isolated from the solution by concentration under reduced pressure with the addition of $CaCO_3$, fermentation with baker's yeast to remove sugars, evaporation to small volume, precipitation with 8 volumes ethyl alcohol, and concentration of the alcoholic solution until crystallization occurred. The product had all the characteristic properties of methyl-d-mannoside-a.—Joseph S. Caldwell.

3045. HERRISSEY, H. Synthèse biochimique d'un d-mannoside à partir de mannanes. [Biochemical synthesis of d-mannoside from mannan.] Bull. Soc. Chim. Biol. 5: 133-136. 1923.—The author used 500 gm. of carob beans, which are rich in mannans. These were ground, mixed with 110 gm. of meal made from germinated, dried alfalfa seed, placed in 4,000 cc. of 10% methyl alcohol, and allowed to stand with frequent stirring for 80 days under toluol to permit action of the mixture of enzymes present. That hydrolysis of mannan to mannose and synthesis of methyl-d-mannoside-a occurred was proved by isolation and identification of both substances [see preceding abstract].—Joseph S. Caldwell.

3046. HERRISSEY, H. Sur la réversibilité de l'action fermentaire de la d-mannosidase-a. [The reversibility of action of d-mannosidase-a.] Bull. Soc. Chim. Biol. 5: 501-505. 1923.—Continuing earlier work [see preceding abstract] the authors studied the attainment of equilibrium in a mixture of methyl-d-mannoside-a and methyl alcohol in water and in a dilute solution of mannose in aqueous methyl alcohol when each was submitted to the action of the enzymes of germinated alfalfa seeds for 6 months under toluol. Determinations of reducing sugars in the solutions at the end of the period showed that equilibrium is attained under the conditions of the experiment when the reducing sugar formed equals 46-47% of the mannose or mannoside present.—Joseph S. Caldwell.

3047. JACOBY, M. Über Auxostoffe und künstliche Zymogene. [Growth promoting substances and artificial zymogens.] *Biochem. Zeitschr.* 140: 158-160. 1923.—Artificial zymogens are considered to be inactive enzymes capable of reactivation, and distinct from growth-promoting substances.—*H. D. Hooker, Jr.*

3048. KARCZAG, L. Studien über Oxydationskatalysen. I. [Oxidation catalyses.] *Biochem. Zeitschr.* 117: 69-86. 1921.—The writer studied the oxidizing values of Fe, Cu, Mn, Co, Pt, and Ni by adding small quantities of their salts to a system of dye + H_2O_2 . The dyes were oxidized to colorless compounds. One group of oxidizers, including Fe, Co, Cu, and Mn, possess both oxidase and catalase characteristics; Fe and Co are active in the cold as well as at high temperature ($100^\circ C.$), while Cu and Mn are active only at a high temperature. Co and Mn are retarded by acid H_2O_2 . A second group of oxidizers, including Ni and Pt, possess only the oxidase property, are active at high temperature, are unaffected by acid, and are selective, reacting with only a few of the 34 dyes used. Oxidizers of the 1st group may act as oxidases, catalases, or both, depending upon the dye: for example, Fe acts upon eosin mainly as a catalase, upon dyes like malachite green as an oxidase, while dyes like methyl violet, neutral red, safranin, etc., promote both actions.—*F. G. Gustafson.*

3049. KERB, JOHANNES, UND KURT ZECKENDORF. Weiteres über den Verlauf der alkoholischen Gärung bei Gegenwart von kohlensauren Kalk. [Further studies on the course of alcoholic fermentation in the presence of calcium carbonate.] *Biochem. Zeitschr.* 122: 307-314. 1921.—Contrary to the claims of Fernbach and Schoen no pyroracemic acid is formed when sugar is fermented by yeast in the presence of $CaCO_3$. Both top and bottom yeasts were used.—*F. G. Gustafson.*

3050. KURONO, K. Über Sulfatase. I. Über die enzymatische Spaltung der Phenolätherschwefelsäure. [Sulfatase. The enzymatic cleavage of sulphuric acid phenol ethers.] *Biochem. Zeitschr.* 140: 295-298. 1923.—Taka diastase was found to contain an enzyme which hydrolyzed sulphuric acid phenol ethers to some aromatic compound and H_2SO_4 . No reaction was obtained after boiling the enzyme, which is called sulfatase.—*H. D. Hooker, Jr.*

3051. LABORDE, E., L. JALOUSTRE, ET MAURICE LEULIER. Influence des substances radioactives sur la fermentation acetique. [Influence of radioactive substances on acetic fermentation.] *Bull. Soc. Chim. Biol.* 4: 415-418. 1922.—Experiments upon *Myroderma aceti* in a mixture of red wine and water containing 4.5% of alcohol kept at $28-30^\circ C.$ indicated that mesothorium in amounts of one-millionth to one ten-millionth gm. per 100 cc. stimulated acetic fermentation for 4-5 days, subsequently retarding it. Thorium X in amounts of one-millionth gm. per 100 cc. completely prevents the action. The authors propose to extend the work by varying the alcohol content and temperature of the medium, the nature and amount of the radioactive substances, and by the addition of $CaCO_3$ to fix the acid formed and prevent its destruction.—*Joseph S. Caldwell.*

3052. LABORDE, E., L. JALOUSTRE, ET MAURICE LEULIER. Note relative à l'influence des substances radioactives sur la fermentation acetique. [The influence of radioactive substances on acetic fermentation.] *Bull. Soc. Chim. Biol.* 4: 644-647. 1922.—The addition of thorium X in amounts ranging from 0.006-0.104 mgm. in 100 cc. to dilute wines inoculated with *Myroderma aceti* entirely prevents the conversion of alcohol into acetic acid. The addition of 0.001 mgm. in 100 cc. is without effect. The addition of neutral potassium tartrate or of $CaCO_3$ to fix the acid formed did not influence the results.—*Joseph S. Caldwell.*

3053. LUNDIN, H. Über den Einfluss des Sauerstoffs auf die assimilatorische und dissimilatorische Tätigkeit der Hefe. I und II. [The influence of oxygen on the assimilatory and dissimilatory activity of yeast.] *Biochem. Zeitschr.* 141: 310-369. 6 fig. 1923.—When yeast was grown in glucose or fructose solutions exposed to the air or shaken with O_2 and in the absence of a source of N, the sugar disappeared and the number of yeast cells was not increased. Under similar conditions galactose did not disappear. Fat and acetaldehyde were not formed. As much CO_2 was produced as in typical fermentation, but less alcohol was present. Part of the alcohol produced was resynthesized to carbohydrate. Sugar was not assimilated directly. One-third of the total energy content of the indirectly assimilated sugar was released by the processes of fermentation and assimilation. Assimilation appeared to be a respiratory process and the fermentation preparatory to it.

The product of assimilation was glycogen, of which a constant proportion only (about 50%) was readily hydrolyzed, and was subject to fermentation or respiration. Assimilation was independent of the velocity of fermentation. The percentage of alcohol assimilated was independent of the sugar concentration and the amount of yeast, but its absolute amount was proportional to the sugar concentration. The introduction of O_2 increased both the amount and percentage of alcohol assimilated. The dry weight, but not the number, of the yeast cells was increased by assimilation. As long as sugar was present in the solution, the yeast respired no more than yeast to which no sugar had been supplied. After the sugar was exhausted the rate of respiration became greater. The assimilation caused an increase in the size of the yeast cells and an increased energy consumption, which was met by sugar fermentation and assimilation of alcohol. No relation existed between respiration and fermentation or between oxygen supply and fermentation.—*H. D. Hooker, Jr.*

3054. MAY, A. v. Über die Einwirkung von Metallsalzen auf den Verlauf der alkoholischen Gärung. [The effect of metal salts on the course of alcoholic fermentation.] *Biochem. Zeitschr.* 141: 447-457. 1923.—The appearance of small amounts of acetaldehyde during yeast fermentation occurred not only in the presence of Zn and Cd salts but in the presence of salts of Ca, Ba, Be, Mg, and Fe, and to a less degree in the presence of Ni, Sn, Pb, Al, and Tl.—*H. D. Hooker, Jr.*

3055. MIEHE, HUGO. Über die Lebensdauer der Diastase. [The duration of life of diastase.] *Ber. Deutsch. Bot. Ges.* 41: 263-268. 1923.—For his experiments the author used rye which was at least 112, and probably 280, years old. The embryo was disintegrated, the endosperm intact, and the starch responded to the iodine test. Enzymes were extracted which changed starch to sugars, and differed from those of fresh rye extract only in acting more slowly. The activity of the enzyme had persisted long after the viability of the embryo was lost. The author suggests that seeds are often damaged in drying, and that, if gradually dried, they might remain viable longer than any known. The long life of the enzyme suggests a change in present conceptions of the biological character of the enzyme.—*Hally Jolivet Sax.*

3056. NAGAI, K. Über die Bildung von Acetaldehyd bei der Vergärung von Fructose, Galactose, Saccharose, Maltose und Lactose durch *Bacterium coli* und *Bacillus lactis aerogenes*. [Acetaldehyde formation during fructose, galactose, sucrose, maltose and lactose fermentation by *Bacterium coli* and *Bacillus lactis aerogenes*.] *Biochem. Zeitschr.* 141: 261-265. 1923.—Acetaldehyde was obtained when these sugars underwent fermentation by *Bacterium coli* or by *Bacillus lactis aerogenes* in the presence of $NaHSO_3$. The yield was 0.56-5.47%. During the fermentation of fructose and lactose by *Bacterium coli* the amount of aldehyde decreased, indicating its utilization by the bacteria as a source of carbon.—*H. B. Hooker, Jr.*

3057. NAGAI, K. Über die Bildung von Acetaldehyd beim bakteriellen Abbau von Säuren der Kohlenhydratreihe und verwandten Säuren. [Acetaldehyde formation by bacterial decomposition of acids of the carbohydrate series and related acids.] *Biochem. Zeitschr.* 141: 266-268. 1923.—Acetaldehyde was obtained when malic acid, *d*-gluconic acid, *d*-glyceric acid, *dl*-lactic acid and *d*-tartaric acid in the form of the Ca salt or other alkali salt underwent fermentation by *Bacterium coli* or by *Bacillus lactis aerogenes* in the presence of $NaHSO_3$. Quantitative determinations showed that the amount of acetaldehyde at first increased and later decreased.—*H. D. Hooker, Jr.*

3058. NEUBERG, CARL, UND BERNHARD ARNSTEIN. Vom Wesen der Buttersäure und Butylalkoholgärung. Abfangung von Acetaldehyd als Umsetzungsprodukt. Übergang von Brenztraubensäure-aldol in Buttersäure. Entstehung höherer Fettsäuren aus Zucker. [The manner of butyric acid and butyl alcohol fermentation. Demonstration of the production of acetaldehyde as a transitory product in the butyric acid fermentation. Conversion of pyroracemic acid-aldol into butyric acid. Formation of higher fatty acids from sugar.] *Biochem. Zeitschr.* 117: 269-314. 1921.—When *Bacillus butylicus* Fitz. is grown in a mineral nutrient solution to which dextrose and $CaCO_3$ have been added, butyric acid is produced. When an absorbent like Na_2SO_3 is added to this solution, acetaldehyde is obtained. Under such conditions neither butyl alcohol nor butyric acid are formed, only ethyl alcohol and acetic acid. When the absorbent is left out no acetaldehyde is obtained, but both butyl alcohol and butyric acid are

obtained in large quantities, as well as some ethyl alcohol and acetic acid. From these experiments the writers draw the conclusion that acetaldehyde is an intermediate compound in the formation of butyric acid from dextrose by *Bacillus butylicus*, which can also form butyric acid from the α -keto- γ -valerolactone- γ -carbonic acid (pyroracemic acid-alcohol) formed by condensation of 2 molecules of pyroracemic acid. During butyric acid fermentation taking place in mineral nutrient solutions such higher fatty acids as caproic, caprylic, and capric are also formed from dextrose by *B. butylicus* Fitz.—F. G. Gustafson.

3059. NEUBERG, CARL, UND CLARA COHEN. Über die Bildung von Acetaldehyd und die Verwirklichung der zweiten Vergärungsform bei verschiedenen Pilzen. [The formation of acetaldehyde and the realization of the second type of fermentation in different fungi.] Biochem. Zeitschr. 122: 204-224. 1921.—With the aid of an absorbing agent, usually Na_2SO_3 or CaSO_3 , it was demonstrated that many fungi produce acetaldehyde as a transitory product in the fermentation of grape sugar. *Mucor javanicus*, *M. plumbeus*, *M. racemosus*, *Monilia candida*, and *Torula colliculosa* also produce glycerine according to the equation: $\text{C}_6\text{H}_{12}\text{O}_6 = \text{CH}_3\text{CHO} + \text{CO}_2 + \text{C}_3\text{H}_8\text{O}_3$; other fungi produce only acetaldehyde. When the aldehyde is not "absorbed" it is immediately transformed into alcohol.—F. G. Gustafson.

3060. NEUBERG, C., UND A. V. MAY. Die Bilanz der Brenztraubensäuregärung. [The fermentation equilibrium of pyro-tartaric acid.] Biochem. Zeitschr. 140: 299-314. 1923.—Pyro-tartaric acid was fermented by fresh yeast and the following products of fermentation measured: CO_2 as gas evolved, acetaldehyde as the dimethylhydroresorcinol derivative, and acetyl-methyl-carbinol as the p-nitrophenyl-osazone. The amount of CO_2 evolved corresponded with the amount of acetaldehyde formed plus twice the amount of acetyl-methyl-carbinol. This is offered as evidence of the formation of the latter from 2 molecules of acetaldehyde with the elimination of 2 molecules of CO_2 . Similar results were obtained from cell-free fermentations. In the presence of NaHSO_3 only traces of acetyl-methyl-carbinol were produced.—H. D. Hooker, Jr.

3061. OLSSON, URBAN. Über Vergiftungserscheinungen an Amylasen. [Inactivation phenomena in amylases.] Zeitschr. Physiol. Chem. 117: 91-145. Fig. 1-10. 1921.—The optimum acidity for amylase in the presence of NaCl and sodium acetate was pH 6.4. Malt amylase is more sensitive to inactivators than salivary amylase. I and Fl ions do not inactivate malt amylase, but free I is strongly toxic to both salivary and malt amylase. Dialysis of salivary amylase removes an activator, which consists of salts necessary for the enzyme reactions. Olsson suggests the use of sensitive enzymes in detecting quantities of heavy metals too small for detection by ordinary methods.—Chas. A. Shull.

3062. ROCKWOOD, ELBERT W., AND WILLIAM J. HUSE. Studies on enzyme action. The relationship between the chemical structure of certain compounds and their effect upon the activity of urease. Jour. Amer. Chem. Soc. 45: 2678-2689. 1923.—Some compounds promote while others inhibit the action of urease from the jack bean. These effects are not dependent upon H-ion concentration and do not result from the attainment of a concentration of electrolytes favorable or unfavorable to the action of the enzyme. The effect is related to the presence of amino groups and carboxyl groups in the same compound. This promoter effect seems to be a function of the distance between these groups, the stimulation increasing with a decrease in proximity of these groups. α -amino acids are promoters, β -amino acids have a slight effect, and γ -amino acids have no effect. The promoter effect of the isomeric aminobenzoic acids decreases in the order: ortho > meta > para. The replacement of one H of the amino group by benzoyl, or the esterification of the carboxyl group does not diminish the promoter effect. A 2nd carboxyl group or a 2nd amino group in an α -amino acid appears to increase the promoter action slightly.—J. M. Brannon.

3063. SEN, H. K. Über die Gärung der α -Keto-n-capronsäure. [The fermentation of α -keto-N-caproic acid.] Biochem. Zeitschr. 140: 447-452. 1923.—This acid was fermented by yeast to valeraldehyde and amyl alcohol.—H. D. Hooker, Jr.

3064. SHERMAN, H. C., AND MARY L. CALDWELL. A study of the influence of arginine, histidine, tryptophane and cystine upon the hydrolysis of starch by purified pancreatic amylase. Jour. Amer. Chem. Soc. 43: 2469-2476. 1921.—The results obtained in this work show that arginine and cystine favor the digestion of starch. The same has been shown to be true for glycine and phenylalanine. Tryptophane and histidine do not have this favorable influence.—J. M. Brannon.

3065. SHERMAN, H. C., AND FLORENCE WALKER. The influence of certain amino acids upon the enzyme hydrolysis of starch. Jour. Amer. Chem. Soc. 43: 2461-2476. 1921.—When glycine, alanine, phenylalanine or tyrosine are added to starch its hydrolysis by purified pancreatic amylase, commercial pancreatin, saliva, or purified malt amylase is increased. The addition of a mixture of 2 of these amino acids is no more effective than the same concentration of any 1 of them. The H-ion concentration does not seem to be an important factor. Any 1 of these amino acids may restore to full activity an enzyme partially inactivated by CuSO_4 . Amino acids also inhibited the deterioration of the enzymes in water.—J. M. Brannon.

3066. STAPP, C. Beiträge zum Studien der Bakterientyrosinase. [Tyrosinase from bacteria.] Biochem. Zeitschr. 141: 42-69. 1 fig. 1923.—Tyrosinase was found in the nodule bacteria of *Soja hispida*, *Lupinus* sp., *Genista tinctoria*, *Sarothamnus scoparius*, *Coronilla varia*, and *Tetragonolobus purpureus*. This enzyme appeared to be identical with that found in *Russula delicata*. Tyrosines from various sources had different optical properties and were not acted on uniformly by bacterial tyrosinase. Barium tyrosine sulfonate was oxidized more slowly than tyrosine. Hydroxy-phenethylamine was oxidized best as the chloride. β -resorcylic acid was oxidized weakly. Gentisinic acid, 2-4- and 2-5-dinitrobenzoic acid, *o*-aminobenzoic acid and mandelic acid were not oxidized. Bacterial tyrosinase is an endoenzyme which will not pass through a porcelain filter and is inactivated at 60-65°C. The enzyme obtained from old cultures is sometimes less resistant to heat. Inactivation at 65-70°C. is reversible. The velocity of tyrosine oxidation increases with temperature until the enzyme is inactivated. Tyrosinase is active in the range pH 5-10.5, with an optimum at pH 8. Bacteria from *Soja hispida* with a dry weight of 0.00025 grain yield a visible reaction in 1 cc. of tyrosine solution. In this way it is possible to detect tyrosine in a 0.0005% solution. Homogentisinic acid was not obtained as an intermediary of tyrosine cleavage by bacterial tyrosinase.—H. D. Hooker, Jr.

3067. STEPPUHN, O., UND L. UTKIN-LJUBOWZOFF. Über das Wesen der Autolyse. I. Über die Einwirkung von Jod auf Hefeautolyse. [The nature of autolysis. The action of iodine on yeast autolysis.] Biochem. Zeitschr. 140: 17-27. 1923.—An optimum concentration of iodine solution was found for the rate of yeast autolysis. The increase was not produced by acidity or by KI and the action of I was not affected by previous extraction of the yeast with chloroform. The antiproteolytic action of serum was not affected by chloroform. It is concluded that the action of I on autolysis is not connected with its reaction with unsaturated fatty acid compounds.—H. D. Hooker, Jr.

3068. TAKAHATA, T. Über die Bildung der Bakterienurease. [Urease formation by bacteria.] Biochem. Zeitschr. 140: 166-167. 1923.—Urease formation in cultures of *Proteus* bacteria reached a maximum in neutral solutions.—H. D. Hooker, Jr.

3069. TAKAHATA, T. Über die Gewinnung einer Urease-Enzymlösung aus Bakterien. [A urease solution obtained from bacteria.] Biochem. Zeitschr. 140: 168-170. 1923.—*Proteus* bacteria were dried and extracted. Solutions were obtained which showed urease activity.—H. D. Hooker, Jr.

3070. THOLIN, TH. Über die Thermostabilität des Co-Enzyms und seine Abscheidung von Hefevitamin B. [Thermostability of the coenzyme of yeast, and its differentiation from yeast vitamin B.] Zeitschr. Physiol. Chem. 115: 235-256. 1921.—The coenzyme of yeast fermentation is reduced to $\frac{1}{2}$ its activity in 1 hour at pH 5.6 at 96°C., and in 37 minutes at 100°C. The greater thermostability of the coenzyme permits the separation of the vitamin from the coenzyme.—Charles A. Skull.

3071. WEBSTER, D. H. I. Kultur-Versuche mit Soja-Bohnen. II. Vorkommen von Urease in anderen Pflanzenteilen als in Samen. [I. Culture experiments with soy beans. II. Presence of urease in plant parts other than seeds.] Biochem. Zeitschr. 122: 188-192. 1921.—It is unprofitable to grow soy beans in Holland, as they usually do not mature seeds. Urease was found in all parts of the plant.—F. G. Gustafson.

3072. WILLSTÄTTER, RICHARD, UND WILHELM CSANYI. Zur Kenntnis des Emulsins. [Emulsin.] Zeitschr. Physiol. Chem. 117: 172-200. 2 fig. 1921.—A study of the various hydrolyses carried out by emulsin preparations on glucosides and sugars leads to the conclusion that

the various reactions are independent enzyme reactions, and that the preparations are a mixture of enzymes capable of acting upon the complex sugars and β -glucosides.—*Charles A. Shull.*

3073. WILLSTÄTTER, RICHARD, UND RICHARD KUHN. **Bemerkungen über die Elution von Saccharase und Maltase aus ihren Adsorbaten.** [The elution of invertase and maltase from their adsorption compounds.] *Zeitschr. Physiol. Chem.* 116: 53-66. 1 fig. 1921.—In a few minutes invertase is removed quantitatively from its adsorption compound with $\text{Al}(\text{OH})_3$ by use of 16% sucrose in the presence of 1% NaH_2PO_4 , or a citrate buffer of pH 4.5. Sucrose alone removes the invertase very slowly and incompletely, and acetate buffers do not effect elution. Other sugars than sucrose, (glucose, fructose, maltose, lactose), fail to release the enzyme. Maltase could be freed by means of maltose and phosphate, but not by maltose alone. Weak glycerol solutions, 10-6% greatly increase the action of the primary phosphates in some cases.—*Chas. A. Shull.*

3074. WILLSTÄTTER, RICHARD, UND RICHARD KUHN. **Über die spezifische Natur von Saccharase und Raffinase.** [The specific nature of invertase and raffinase.] *Zeitschr. Physiol. Chem.* 115: 180-198. 1 fig. 1921.—This is a study of the relations of invertase and raffinase in various invertase preparations. The 2 enzymes are distinct, but have a very constant ratio, raffinase: invertase = 11.3, in the preparations studied. Preparations coming from yeasts showed ratios of approximately 5.—*Charles A. Shull.*

3075. WILLSTÄTTER, RICHARD, UND WERNER STEIBELT. **Über die Gärwirkung maltasearmer Hefen. IV. Mitteilung über Maltase.** [Fermentation by maltase-poor yeasts.] *Zeitschr. Physiol. Chem.* 115: 211-234. Fig. 1-8. 1921.—In some brewery yeasts the time ratio maltase: invertase was about 20, but in certain distillery yeasts there were very large variations in the ratio, because of fluctuations of the maltase content. Distillery yeasts contain relatively little maltase. The authors claim that some of their results prove that yeasts practically lacking in maltase may rapidly ferment maltose directly, without previous hydrolysis. Even in the maltase-rich strains of yeast, both direct and indirect fermentation of maltose occurs.—*Charles A. Shull.*

3076. WILLSTÄTTER, RICHARD, UND WERNER STEIBELT. **Über die Verschiedenheit von Maltase und α -glukosidase. III. Mitteilung über Maltase.** [Differentiation of maltase and α -glukosidase.] *Zeitschr. Physiol. Chem.* 115: 199-210. 1 fig. 1921.—Enzyme preparations from various yeasts showed great variations in maltase and glukosidase activities, their ratios varying from 7.7 to 0.9, and changing with conditions, such as exposure to cold for a few days. The enzymes are distinct.—*Charles A. Shull.*

METABOLISM (RESPIRATION, AERATION)

3077. HARDER, RICHARD. **Bemerkungen über die Variationsbreite des Kompensationspunktes beim Gaswechsel der Pflanzen.** [The differences of the "compensation point" in the gas exchange of plants.] *Ber. Deutsch. Bot. Ges.* 41: 194-198. 1923.

3078. HUTCHINS, LEE M., AND BURTON E. LIVINGSTON. **Oxygen-supplying power of the soil as indicated by color changes in alkaline pyrogallol solution.** *Jour. Agric. Res.* 25: 133-140. 1923.—For physiological, bacteriological, ecological, and agricultural studies it is desirable to secure quantitative information about the capacity of soils to deliver O_2 to the O_2 -absorbing surfaces of roots and soil organisms at different depths below the air-soil surface. The authors method for measuring this capacity involves a colorimetric arrangement for determining the rate of O_2 absorption through a standard O_2 -absorbing surface previously placed in the soil at the required depth. At a depth of 8 cm. in moist, loose garden soil, the O_2 -supplying power of the soil was found to be 1.73 mgm. per square m. per hour; while at a depth of 11 cm. in firmly packed, wet garden soil the corresponding value was .03 mgm.—*Lee M. Hutchins.*

3079. MAQUENNE, L., ET E. DEMOUSSY. **Resistance des feuilles à l'asphyxie.** [Resistance of leaves to asphyxiation.] *Bull. Soc. Chim. Biol.* 4: 571-576. 1922.—Extending their previous work [see Bot. Absts. 12, Entry 5226] the authors find that a laurel leaf sealed into a dry tube exhausted of air retained the power of decomposing appreciable amounts of CO_2 when placed in the light after 6 months. Leaves of *Ligustrum* and pear and very young leaves of *Euonymus* had lost such power although they appeared healthy. When placed in strong light they

rapidly dried out. Leaves of different species show great differences in the time they are able to survive in the absence of air, the extremes ranging from 24 hours for *Rumex acetosa* to more than a year for *Aucuba*. Caducous leaves, as those of dahlia, geranium, beet, and pea, are short-lived persistent leaves and those with coriaceous parenchyma endure the treatment much longer. The period during which leaves of any variety will survive is closely related to the ratio $\frac{I}{N}$, I being the amount of CO_2 liberated per hour in vacuo by 100 gm. of leaves after a period of preservation in vacuo, while N represents the normal respiration, that is, the amount of CO_2 liberated by a like quantity of freshly plucked leaves. If the $\frac{I}{N}$ ratio is equal to or exceeds unity and remains approximately constant over a period of 16 hours, the leaves will remain living in vacuo for a long period, whereas those in which the $\frac{I}{N}$ ratio is initially less than unity and decreases rapidly during a 16-hour test period, will not furnish sufficient CO_2 to permit photosynthesis to continue in vacuo and will consequently succumb to starvation after exhausting their reserves.—*Joseph S. Caldwell.*

3080. RIGG, GEORGE B., THOMAS G. THOMPSON, AND WILLIAM L. CHILLILAND. The influence of plants on the air in houses. *Amer. Jour. Bot.* 10: 383-386. 1923.—Determinations were made of the percentage of CO_2 in the air of a greenhouse well filled with plants, at various times of the day. Contrary to what might have been expected, the amount of this gas was found to be greater in the afternoon than in the forenoon. The authors suggest that this is due to the presence of visitors in the afternoon. The effect of the plants themselves on the CO_2 content is believed to have been negligible. At no time did the concentration approach that found to be injurious to human beings. The presence of plants in reasonably ventilated sleeping rooms therefore presumably has no unfavorable effect, so far as their influence on the amount of CO_2 is concerned.—*E. W. Sinnott.*

3081. RONA, P., UND K. GRASSHEIM. Studien über Zellatmung. II. Die Wirkung von Chinin auf die Atmung lebender Hefezellen. [Cell respiration. The action of quinine on the respiration of living yeast cells.] *Biochem. Zeitschr.* 140: 493-516. 25 fig. 1923.—The respiration of *Torula pulcherrima* was retarded by 1 part in 10 of a 0.02 M solution of quinine chloride. The inhibition increased with rising pH values. At each pH value a maximum effect is produced after a certain interval; for example, 2 hours for 0.04 M quinine chloride solution. Destruction of the yeast cells by freezing and thawing did not alter the retarding effect but caused it to reach a maximum immediately. The logarithm of the amount of retardation was found to be a geometric function of quinine concentration at constant pH values. At any given concentration the retardation was proportional to the pH. When the H-ion concentration was increased, apparent stimulation of respiration occurred, not, however, to a point equal to respiration under optimal reaction in the absence of quinine. It is assumed that the apparent stimulation is the result of a decreased permeability of the cell membranes to H ions. After working 1 year with certain yeast cultures, they were found to have altered physiologically, the optimum H-ion concentration for respiration being greater, approximating neutrality.—*H. D. Hooker, Jr.*

ORGANISM AS A WHOLE

3082. BAILEY, C. H., AND JULIUS HENDEL. Correlation of wheat kernel plumpness and protein content. *Jour. Amer. Soc. Agron.* 15: 345-350. 1923.—Relatively large variations in crude protein, or crude gluten, content, and kernel plumpness of hard spring wheat samples grown in northwest U. S. A. have been observed in each of several seasons. No significant correlation has been found between wheat kernel plumpness and crude protein (or crude gluten) content, when the former was measured in terms of either weight per 1,000 average kernels or weight per bushel.—*F. M. Schertz.*

3083. BARTHEL, CHR. Contribution a la recherche des causes de la formation des bacterioides chez les bacteries des legumineuses. [Causes of the formation of bacterioids.] *Ann. Inst. Pasteur* 35: 634-647. 6 fig. 1921.—Confirming Zipfel's work, which demonstrated that bacterioids may be formed on solid media by the action of caffeine in pure cultures of legume bacteria, the author shows also that other alkaloids, guanidine, pyridine, and chinoline act

similarly. Other organic N compounds such as hippuric acid also cause involutions, but less frequently. It is suggested that, since alkaloids occur in legumes and presumably in their roots, bacteroidal formation there is due to these compounds.—*Ernest Shaw Reynolds.*

3084. GRÖER, FR. v. *Diphtherietoxinstudien II. Untersuchungen über die Toxinbildung.* [The formation of diphtheria toxin.] *Biochem. Zeitschr.* 138: 34-42. 2 fig. 1923.—The direct and indirect toxicity, H-ion concentration, conductivity, optical rotation, refraction, and amino N content were determined daily in growing cultures of diphtheria bacilli. The toxicity at the reaction developed spontaneously by the culture was found to depend on toxin formation, on activation of the toxic substance by the increasing alkalinity of the culture, and on autolysis of the toxin. Actual toxicity is distinguished from absolute toxicity, the latter being the toxicity of the culture at pH 8.6-8.8.—*H. D. Hooker, Jr.*

3085. MORSE, F. W. *Influence of plane of nutrition on susceptibility to injury from toxic concentrations.* *Jour. Amer. Soc. Agron.* 15: 297-300. 1923.—Development of unhealthy conditions in the crop is likely to be due to faults in the plane of nutrition, and the irregularity must be sought and measured by consideration of the different conditions of plant growth, the resultant of which is the plane of nutrition.—*F. M. Schertz.*

3086. WAKSMAN, S. A. *The influence of soil reaction upon the growth of Actinomycetes causing potato scab.* *Soil Sci.* 14: 61-79. 1 fig. 1922.—The limiting acid reaction for the growth of *Actinomyces scabies* in culture solutions and in soil varies with the strain. For most strains the limiting acid reaction is pH 5.0-5.2, for some pH 4.8, for others pH 5.3-5.6. The saprophytic soil Actinomycetes are more resistant to acid.—*W. J. Robbins.*

GROWTH, DEVELOPMENT, REPRODUCTION

3087. CHAUDHURI, H. *A study of the growth in culture of Verticillium albo-atrum, B. et Br.* *Ann. Botany* 37: 519-439. 12 fig. 1923.—*Verticillium albo-atrum* grows on a large variety of media, always rendering them alkaline. The optimum temperature for growth is 22.5°C., the maximum 30°C., and the minimum 10°C. Aeration in liquid media markedly increases not only the rate of growth but also the total amount of growth in a given volume of medium. It appears to increase growth by reducing the production of waste products, rather than by removing waste products already formed. The rate of surface spread of a culture on a solid medium was compared with the rate of increase in dry-weight. The rate of "spread" as a measure of actual production of fungous material proved extremely untrustworthy. It gives, however, a satisfactory measure of the effect of different temperatures on the rate of growth in a medium of constant composition and thickness. When, however, different media are concerned, the same rate of surface spread may be associated with extremely different rates of mycelium production. For cultures on solid media in the dark, zonation appears only at about 25°C.; there is no zonation at 24°C. or at 26°C. In the light, however, such cultures show zonation at about 23°C. The zones are more closely packed in a culture on a thick layer of medium than in one on a thin layer. There is no evidence that accumulation of waste products in any way favors zone formation.—*Margaret Newton.*

3088. TERROINE, EMILE F., ET RENÉ WURMSER. *L'énergie de croissance. I. Le développement de l'Aspergillus niger.* [The energy of growth. I. Development of *Aspergillus niger*.] *Bull. Soc. Chim. Biol.* 4: 519-567. 1922.—Earlier workers attempted (1) to determine the coefficient of utilization (ratio of dry substance formed to food material utilized); (2) to determine the gross energy yield (ratio of the potential energy stored in the organism during growth to the total potential energy of the food supplied minus the potential energy of the unused residues); (3) to determine the real or net energy yield (energy stored in the form of new tissues as distinguished from that expended in metabolism and maintaining body temperature.) The present investigation pursues the 1st and 3rd of these lines. Employing cultures of *Aspergillus niger* upon Czapek's nutritive medium with various organic additions, the authors determined the effect of temperatures between 22 and 38°C.; of H-ion concentrations between pH 7.7 and pH 1.2; of 6 carbohydrates as sources of C; and of (NH₄)₂SO₄, nitrates of Na, NH₄, Al, also HNO₃, guanidine, and urea as sources of N. The fungus was quite sensitive to temperature, the gain in weight at 36°C. being practically double that at 22°C. Growth occurred at a practically constant rate at all pH concentrations between 7.7 and 3.0,

then fell off rapidly to less than $\frac{1}{2}$ this rate at 1.2. The nature of the source of C for the 6 sugars (arabinose, xylose, maltose, saccharose, glucose, and levulose) was without effect upon the rate of growth. The concentration of the source of N could be varied from 5 to 40 parts per 1,000 without effect upon the growth rate, but its nature exercised considerable influence. NH_4NO_3 , $(\text{NH}_4)_2\text{SO}_4$, guanidine, urea, and HNO_3 of pH 2.1–2.2 gave equal growth, while NaNO_3 , $\text{Al}(\text{NO}_3)_3$, and HNO_3 of pH 6.1–6.2 produced considerable depression of growth rate. The coefficient of utilization—ratio of dry weight to C source consumed—was practically constant at 0.44 at all temperatures, for all the sugars used, at all pH concentrations between 7.7 and 3.0, with 5–40 parts per 1,000 of $(\text{NH}_4)_2\text{SO}_4$, and with all sources of N except NaNO_3 and $\text{Al}(\text{NO}_3)_3$, which reduced the coefficient to 0.35. The method employed in the study of the energy yield was to determine the CO_2 given off during development, the heat of combustion of the dry mycelium, that of the food material supplied, and that of the unused residue. The net yield of potential energy utilized in growth is approximately 70%; the remaining 30% must be expended in metabolic processes and lost as heat. The results are, therefore, of the same general order as those obtained in studies of the growth of animals. A bibliography of 40 titles accompanies the paper.—*Joseph S. Caldwell.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

3089. BRAUNER, LEO. Über den Einfluss der Koleoptilespitze auf die geotropische Reaktion der Avenakeimlinge. [The influence of the coleoptile tip on the geotropic reaction of the Avena seedling.] Ber. Deutsch. Bot. Ges. 41: 208–211. Fig. 1–2. 1923.—The coleoptile tip of Avena seedlings is capable of carrying out the reaction of the stimulated stump when it is not itself stimulated. From this the author concludes that the stimuli do not influence the formation of regulatory materials in order to produce an asymmetric growth. He suggests that in geotropism there may be a primary change in permeability in the tip.—*Hally Jolivette Sax.*

3090. KOTTE, WALTER. Zur Reizphysiologie der Fucus-Spermatozoiden. [Physiology of the attraction of Fucus spermatozooids.] Ber. Deutsch. Bot. Ges. 41: 24–32. 1923.—The Fucus spermatozooids are attracted to the egg cells by phototaxis, chemotaxis, aerotaxis, thigmotaxis, and perhaps geotaxis. The author after considering these factors individually shows how the combined effect results in fertilization. Chemotaxis is not effective until other factors have brought the spermatozooids within a relatively close range.—*Karl Sax.*

3091. METZNER, P. Über induzierten Phototropismus. [Induced phototropism.] Ber. Deutsch. Bot. Ges. 41: 268–274. 1923.—The author found that organisms which do not respond phototropically may be induced to do so by sensitizing color materials. For this study he used roots of *Avena sativa*, *Raphanus sativus*, and *Lepidium sativum*, which show no phototropism except when erythrosin and other sensitizing color materials are used. Two kinds of curvature are recognized: 1st, passive curvature, when too strong light is used, the result being one of injury to the epidermal cells on the side toward the light; 2nd, active curvature, with less intense light, inducing a normal positive phototropic reaction. It is suggested that according to the intensity of the light the effect may be chemotropic or traumatropic. Normal phototropism may have a similar basis.—*Hally Jolivette Sax.*

3092. SCHMID, GÜNTHER. Versuche der Stereoverhalten der Oscillarien. [Experiments on stereo-relations of Oscillatoria.] Biol. Centrabl. 41: 173–187. Fig. 1–5. 1921.—The belief that movements of Oscillatoria filaments show characteristics of a stereotropic nature is not based on detailed observations. The author made use of *Oscillatoria curviceps* Ag., a large form, placing the filaments in all cases on some type of agar surface. The movements in Oscillatoria would be definitely stereotropic if the filaments responded to all the deviations from a plane of the substratum by corresponding bends of the filaments, as a result of contact stimuli.—Agar surfaces vary greatly as regards moisture. Surfaces of 1–2% solutions contain a relatively heavy water-film, while 5% agar gels appear to the naked eye entirely dry on the surface. On agar block surfaces of 2% concentration filaments of *Oscillatoria* crept over right-angled edges with ease. In most cases on reaching the edge the threads made deviations from the first direction towards the right. Physical forces influence the movement of filaments in such cases. Interpretation of results of a series of experiments

preclude the idea, according to the author, that phobic stereotaxis governs the movements of *Oscillatoria* filaments placed between closely appressed agar surfaces. In all cases the filaments crept out from under the overlying agar surface and continued along the lower agar surface without change.—Theoretically, single threads of *Oscillatoria* when placed on a horizontal surface of a 5% agar block, would, if stereotropic influences were present, creep on to the vertical surface by the bending of the end region of the filament. Experiments prove, however, that on such agar blocks, placed so that the primary movement surface is vertical, the filaments on reaching the edge project vertically into the atmosphere. In such cases the surface tension of the film of water is not a factor. If the air is not entirely dry the end of the filament describes the typical circular movement noted for this form. No hydro-tropism was apparent, since no filaments exhibited any tendency to creep towards neighboring surfaces so placed as to receive more surface moisture. In cases where the neighboring surfaces are not at right angles to the initial movement surfaces, it seems that the gyrations of the free filament ends often result in contact with these sloping surfaces. Where the thread end touches the slope it sticks by means of the gelatinous sheath which envelops the form.—These experiments indicate to the author that *Oscillatoria curviceps* is neither stereotactic nor stereotropic. To attempt to apply this conclusion to all *Oscillatorias* would be erroneous. In any case there is no reason to accept stereotropic behavior for other forms of *Oscillatoria*. This investigation has also disclosed varied forms of movement phenomena on surfaces which are influenced only by physical factors.—*F. A. Abegg.*

3093. ZAEFFEL, EDGAR. Contribution à l'étude du géotropisme. [Geotropism.] Ann. Sci. Nat. Bot. 5: 97-192. 1923.—A detailed experimental study of geotropism in the various parts of the seedlings of certain grasses is reported. Movement of the starch grains in the cell disturbs the equilibrium between the starch grains and the products of their hydrolysis. This affects turgidity by changing the osmotic condition of different parts of the cell. Unequal growth of upper and lower parts of the cell results. The author concludes that geotropism may be fully explained by the application to these conditions of known laws of physics, chemistry, and mechanics.—*Paul Weatherwax.*

GERMINATION, RENEWAL OF ACTIVITY

3094. KOZMA, DÉNES. Gyommagvak a talajban. [Behavior of weed seeds in soil.] Kül-önlenyomat a kísérletügyi közlemények 25: (1922). Kötetéből. [Rept. Roy. Hungarian Seed-Control Station, Budapest 25: (1-79). 1922.] German summary, p. 74-79.—These experiments purposed to determine (a) how long and to what extent buried weed seeds retain vitality, (b) from what depths and in what numbers the seedlings reach the soil surface. The seeds were buried 8, 15, 30, and 50 cm. in sandy and loam soil and the germination, at various intervals for 4½ years, was compared with that of similar samples stored in the laboratory. *Agrostemma Githago* and *Agropyron repens* seeds germinated well at first but failed to germinate after lying in the soil 1½ years. *Chenopodium album*+, *Cirsium arvense*+, *Daucus Carota*+, *Galium Aparine*, *Hyoscyamus niger*+, *Melilotus officinalis*, *Plantago lanceolata*+, *Polygonum aviculare*, *Raphanus raphanistrum*+, *Sinapis arvensis*, *Vicia striata*, *Cuscuta arvensis* var. *calycina*, and *Delphinium consolida* were slow in germinating, some seeds germinating after lying in the ground 4½ years (+ = increase in percentage of germination after 1st year). Most of the seeds used lose their vitality more rapidly in sandy than in loamy soil. No plants developed from seed buried 50 cm. *Cuscuta* seedlings did not reach the surface if the seeds were buried 15 cm. or more.—*W. C. Muenscher.*

3095. OPPENHEIMER, HEINZ. Keimungshemmende Substanzen in der Frucht von Solanum Lycopersicum und in anderen Pflanzen. [Germination-inhibiting substances in the fruit of Solanum Lycopersicum and other plants.] Sitzungsber. Akad. Wiss. Wien (Math.-Nat. Kl.) Abt. I. 131: 59-65. 1922 [1923].—It was found that germination of tomato seed on filter paper placed in Petri dishes was inhibited or at least retarded if the paper was moistened with tomato fruit sap in various concentrations, the inhibiting effect being less with diminishing concentration and disappearing when pure water alone was used. It was shown that the effect was not an osmotic one due to the fruit juice being hypertonic to the cell sap of the seed, nor was inhibition brought about by toluol, which was used as an antiseptic in the cultures with fruit

juice. Similar results were recorded for the seed of *Cucumis sativa* and *Lagenaria vulgaris*, and the gemmae of *Marchantia polymorpha*. On the other hand, there was no inhibition of germination in *Phaseolus multiflorus* and *Cheiranthus cheiri* even though the seed remained within the moistened fruit during germination.—*F. Weiss*.

TEMPERATURE RELATIONS

3096. COFFMAN, F. A. The minimum temperature of germination of seeds. Jour. Amer. Soc. Agron. 15: 257-270. 1923.—The germination of the seeds of different species is diverse in relation to temperature. Within a given species starchy seed appear unable to resist low temperatures to the same degree as the more oily seed, without injury and reducing germination percentages. Small grains germinate at the temperature of melting ice. Strength of germination under freezing conditions appears to be in the following order: barley, rye, wheat and oats; oats being more affected by low temperature than the other grains. The softer and more starchy varieties of sorghum appear less able to withstand low temperatures than the harder seeded varieties, such as Freed. Seed of alfalfa and clover germinate more readily at low temperature than any of the other seed of the commonly grown crops. Seed testing laboratories probably could use advantageously lower temperatures for the germination of clovers, alfalfa, and the cereals.—*F. M. Schertz*.

3097. KAHHO, HUGO. Über die Beeinflussung der Hitzekoagulation des Pflanzenprotoplasmas durch Neutralsalze. [The influence of neutral salts on heat coagulation of plant protoplasm.] Biochem. Zeitschr. 117: 87-95. 1921.—The coagulation temperature of the protoplasm of the epidermal cells of *Tradescantia zebrina* is influenced by both the anions and cations of a salt. In general, increase in concentration of a salt lowers the coagulation temperature. Using K salts the effectiveness of the anions in lowering the coagulation temperature follows the lyotropic series: $\text{CNS} > \text{Br} > \text{I} > \text{NO}_3 > \text{Cl} > \text{tartrate}$, $\text{CH}_3\text{COO} > \text{citrate} > \text{SO}_4$. The effectiveness of the cations is $\text{K}, \text{NH}_4 > \text{Na}, \text{Li}, \text{Ca} > \text{Mg}, \text{Ba}, \text{Sr}$. The last 3 seem to be without influence on coagulation. The influence of the salt upon coagulation seems to be connected with its ability to penetrate the plasma membrane, as those salts penetrating most readily exert the greatest influence.—*F. G. Gustafson*.

3098. KROHN, VAINO. Studien über thermophile Schizomyceten. [Thermophile bacteria.] Ann. Acad. Sci. Fennicae 21A: 1-125. 1 fig. 1923.—Using slight modifications of the usual bacteriological culture procedure, the author worked with *Bacillus thermophilus cocciformis* Nègre, *B. thermophilus de sable* Nègre, *B. thermophilus I* Krohn, *B. thermophilus II* Krohn, and *Actinomyces thermophilus* Krohn; also for some bacteria with lower thermal optima, *A. trivialis* Krohn, *B. subtilis* Cohn, and *B. coli communis* Esch. There were investigated the effects of certain N and C sources and concentrations, a certain range of pH (6.3-9.5), various O_2 tensions, and temperature (45-75°C.). The nutrition series was very extensive as to C (carbohydrates, alcohols, esters, and organic acids) and N (chiefly peptone, amino acids, organic and inorganic salts of NH_4 , and KNO_3). An elaborate summary of the thermophilous organisms used by previous investigators and the important life relations of these species are tabulated. Finally, an extensive study was made of the effects of dye stuffs, whether readily penetrable, slowly penetrable, or relatively impenetrable (70 in all, representing the most diverse groups) on the bacterial harvest. In all cases the amount of growth in any culture was determined by centrifugalization in a graduated centrifuge tube. The author is convinced that thermophilous organisms may not be separated off as a distinctive morphological group, nor yet as a group which is unrelated physiologically to non-thermophilous forms. There is a quantitative but not a qualitative difference associated with this special resistance to high temperature. The thermophilous forms are undoubtedly of rather heterogeneous origin and may be simply designated as organisms having a high temperature optimum.—*B. M. Duggar*.

3099. SHERMAN, H. C., AND M. R. GROSE. A quantitative study of the destruction of vitamin B by heat. Jour. Amer. Chem. Soc. 45: 2728-2738. 1923.—When vitamin B of slightly acid tomato juice has been heated for 4 hours, there is an appreciable destruction due to the effect of hot water upon the vitamin and not to the air dissolved in the juice. This is shown by the fact that much longer heating at 100°C. in the dry state with free access of air resulted in no appreciable destruction. "The average figures for the destruction of vitamin B in

tomato juice, derived directly by determining the size of heated doses at each temperature necessary to give weight curves approximately coinciding with those of positive controls fed 4 cc. of unheated juice, are for a period of 4 hours' heating as follows: at 100°, 20%; 110°, 33%; 120°, 47%; 130°, 55%." The authors find no departure from the ordinary course of a chemical reaction under the accelerating influence of heat. "In this respect the heat destruction of the vitamin is in marked contrast with the heat coagulation of typical proteins and with the heat destruction of such typical enzymes as have been investigated."—*J. M. Brannon.*

3100. SHERMAN, H. C., AND ADELAIDE SPOHN. A critical investigation and an application of the rat-growth method for the study of vitamin B. *Jour. Amer. Chem. Soc.* 45: 2719-2728. 1923.—Vitamin B is not injured in dry milk after heating for 48 hours at 100°C., while in fluid milk vitamin B is reduced about $\frac{1}{4}$ when heated for 6 hours at 100°C.—*J. M. Brannon.*

RADIANT ENERGY RELATIONS

3101. SCHANZ, F. Erscheinungen der optischen Sensibilisation bei den Pflanzen. [Phenomena of optical sensibility in plants.] *Ber. Deutsch. Bot. Ges.* 41: 165-170. 1923.—The author grew bean and begonia plants in nutrient solutions containing equivalent amounts of eosin, erythrosin, and other compounds, both in light and in darkness. Those in eosin and erythrosin died when grown in the light, but not when grown in darkness. The author concludes that eosin and erythrosin are not in themselves poisonous but are extremely injurious in the presence of light. They act as sensitizers and through them the effect of the short-wave light rays is increased. Electrons are separated from the sensitizers by the short-wave light rays and taken up by the albumin molecule, thus causing injury to the plant. Methylene blue does not act in this way.—*Hally Jolivette Sax.*

TOXIC AGENTS

3102. BOHNSON, VAN L., AND A. C. ROBERTSON. The catalytic decomposition of hydrogen peroxide by ferric salts. 2. *Jour. Amer. Chem. Soc.* 45: 2493-2503. 1923.—In a previous paper it was suggested that ferric acid (H_2FeO_4) was formed by the reaction between H_2O_2 and the iron salt, the ferric acid later being reduced with the evolution of O_2 . By photographing the absorption spectra of different solutions the existence of this intermediate compound was demonstrated. In the reaction between the ferrous salt and H_2O_2 the catalytic effect of the ferrous salt is shown to be due to its oxidation to a ferric salt. The ferric salt as well as the ions seem to be catalytically active.—*J. M. Brannon.*

3103. BOHNSON, VAN L., AND A. C. ROBERTSON. Promoter action in homogeneous catalysis. 1. Copper salts as promoters in the iron salts catalysis of hydrogen peroxide. *Jour. Amer. Chem. Soc.* 45: 2512-2522. 1923.—A small amount of copper salt accelerates the decomposition of H_2O_2 by iron salts in acid solution. Other metallic salts do not have this "promoter reaction." For a given concentration of iron salt there is a maximum rate of reaction with about 1 millimole per l. of added copper salt. The extent of the promotion is independent of the acid concentration and temperature. The above findings are explained as follows: the iron salt is the primary catalyst and the copper salt hastens the formation and decomposition of the intermediate compound. "The effect of the secondary catalyst is dependent upon its concentration for very small quantities, a maximum effective concentration being noticeable."—*J. M. Brannon.*

3104. KAHHO, HUGO. Ein Beitrag zur Giftwirkung der Schwermetallsalze auf das Pflanzenplasma. III Mitteilung. [The toxic reaction of salts of the heavy metals to plant protoplasm. III.] *Biochem. Zeitschr.* 122: 39-42. 1921.—The effectiveness of bivalent cations in coagulating the protoplasm of red cabbage is as follows: $\text{Hg} > \text{Cu} > \text{Zn} > \text{Pb} > \text{Fe}$, $\text{Co} > \text{Mn}$, Cd , $\text{Ni} > \text{Ca}$. This agrees very closely with the order of their solution pressures, that is, the ability of the metals to go into solution, Zn and Ni being the only ones out of order. He concludes that the toxic action of bivalent cations of heavy metals upon plant protoplasm in the main is parallel with their electrolytic solution pressures.—*F. G. Gustafson.*

3105. LUGER, A. Über die Wirkung metallischen Kupfers und Silbers auf Diastase. Ein Beitrag zur Kenntnis der sogenannten oligodynamischen Phänomene. [The action of metallic copper and silver on diastase. The so-called oligodynamic phenomenon.] *Biochem. Zeitschr.* 117: 153-160. 1921.—Metallic copper and silver inhibited the action of diastase on starch. Silver was less toxic than copper. As proof that the oligodynamic effect is due to dissolved particles of the metal, the writer points to the fact that such salts as KCN, NaCl, KS, and $\text{Na}_2\text{S}_2\text{O}_3$ neutralize to some extent the toxic effect of the metals when added to the toxic solutions. He holds that this can only be explained by assuming that the salts unite with dissociated ions of the metals, thus reducing the toxic effect.—*F. G. Gustafson.*

3106. PESCH, K., UND K. STRELOW. Der Einfluss der Nebennierenbestandteile auf das Wachstum von Bakterien und deren Toxinbildung. [The influence of adrenal constituents on the growth of bacteria and toxin formation.] *Biochem. Zeitschr.* 140: 353-355. 1923.—Bacterial growth was not stimulated in any case. The growth of diphtheria bacteria was inhibited by the medulla of adrenals and toxicity was reduced by the cortex, which is thought to contain substances that combine with the toxin.—*H. D. Hooker, Jr.*

3107. RIGG, GEORGE B. Effects of copper wire on trees. *Science* 56: 687. 1922.—Pieces of copper wire were driven into young trees 2-4 inches in diameter. After 3 years the trees appeared perfectly healthy. About the wire the wood appeared brown for short distances but showed very little injury.—*J. R. Schramm.*

3108. SCHOELLER, W., UND A. HECK. Zur Theorie der Desinfektion. [A theory of disinfection.] *Biochem. Zeitschr.* 140: 28-41. 2 fig. 1923.—Adsorption constants were determined for total adsorption and anhydride adsorption of the hydroxy mercuric derivatives of sodium toluate, sodium benzoate, sodium anthranilate and sodium salicylate by animal charcoal. The periods required to kill *Staphylococci* were of the same order and sequence as a logarithmic function of the adsorption constants. A theoretical discussion follows.—*H. D. Hooker, Jr.*

3109. SHERMAN, H. C., AND MARGUERITE WAYMAN. Effect of certain antiseptics upon the activity of amylases. *Jour. Amer. Chem. Soc.* 43: 2454-2461. 1921.—In low concentrations chloroform did not affect commercial pancreatic or malt extract. When these enzymes were purified, chloroform diminished their action. Concentrations of chloroform of 0.0000124 M measurably diminished the action of these enzymes when they were purified. Toluene did not affect the purified or unpurified extract. A formaldehyde concentration of 0.0000116 M gave a 3% destruction of the activity of commercial pancreatin. The action of purified malt extract, commercial taka diastase, purified pancreatic amylase, saliva, and purified amylase of *Aspergillus Oryzae* was reduced by this antiseptic. All the enzymes studied were sensitive to CuSO_4 . "The percentage loss of enzyme action due to formaldehyde and to copper sulphate solution did not depend upon the ratio of the antiseptic to enzyme or of antiseptic to the substrate, but upon the ratio of antiseptic to water, or the concentration of the antiseptic in the solution."—*J. M. Brannon.*

3110. STOKLASA, JULIUS. Die Beschädigungen der Vegetation durch Rauchgase und Fabriksexhalationen. [Injuries to vegetation by smoke and gases emanating from factories.] xi + 487 p., 21 pl. 36 fig. Urban & Schwarzenberg: Berlin and Vienna, 1923.—Although this work bears a general title, it represents in reality an elaborate treatment of the relation of the plant to only 1 constituent of smoke or factory gases, this constituent being sulphur dioxide or sulphurous acid. The relations both through air and soil are considered. In the various chapters there are dealt with, though not successively, a variety of topics which may be conveniently grouped as follows: the origin, occurrence, and toxicity of the deleterious compounds; the influence of temperature, light, and other weather conditions on toxicity; a classification of the injuries and an analysis of the cause; the effects on transpiration, photosynthesis, chlorophyll destruction, and protoplasm; injury to man and animals; the influence on the soil biologically and chemically, also the determination of H_2SO_4 in the soil and of SO_2 and of H_2SO_3 in the air, with a description of elaborate apparatus for the latter; methods for lessening and preventing the outgo of these deleterious gases; ordinances and regulations protecting against gas injury; likewise about 40 pages devoted to the occurrence and action of selenium dioxide, considered to be a fairly constant accompaniment of SO_2 . SeO_2 is regarded as very toxic, and

it is suggested that much further work needs to be done in relation to this substance. Some attention is given to the relation of radium radiation to the toxicity of selenium dioxide.—In closing the work the author concludes with the statement that the loss inflicted by the injury to plants, animals, and man in all civilized countries is enormous, the agricultural losses alone in Czechoslovakia amounting to 250–300 million kronen per year. It is stated that in regions of intensive industrial development 30–90% reductions in crops have been noted.—The book consists of observations, critical examinations of the literature, and a considerable number of experimental studies. There is an extensive bibliography and a detailed table of contents, but no index.—*B. M. Duggar.*

3111. TAKAHATA, T. Über die Bedeutung des Glykokolls und des Cyankaliums für die Ureasewirkung. [The effect of glycocoll and potassium cyanide on urease activity.] *Biochem. Zeitschr.* 140: 154–157. 1923.—Glycine reactivated jack bean urease which had been rendered inactive by CuSO_4 , and KCN reactivated urease made inactive by HgCl_2 . In the presence of small amounts of CuSO_4 , KCN also reactivated urease. KCN showed a maximum effect at a certain concentration.—*H. D. Hooker, Jr.*

3112. THOMAS, PIERRE, ET GEORGES CARPENTIER. Action de divers sels métalliques et, en particulier, des sels de cuivre sur le réactif de Kastle-Meyer. [Action of various metallic salts, particularly those of copper, on Kastle-Meyer's reagent.] *Bull. Soc. Chim. Biol.* 4: 143–153. 1922.—The alkaline phenolphthalin solution used by Kastle and by Meyer in the study of the oxidases has been the subject of controversy with respect to the effect of various metallic salts upon its reaction. The authors have consequently reinvestigated the effect of certain salts. They find that the reagent gives a perceptible rose color with 1 part of Cu in the form of any inorganic salt, in 3,300,000 of water, and a rose tint passing over into bright red with 1 part in 1,000,000. The reagent is consequently a much more delicate test for Cu than is potassium ferrocyanide, haematoxylin, or formaldoxine, so delicate, in fact, that water distilled in copper vessels invariably gives the reaction. A colloidal suspension of Cu made by the electric arc does not give the reaction, nor is it given by copper tartrate, lactate, salts of acid amines, or proteinates. Fleig's observation that the fresh blood of various invertebrates does not give a peroxidase reaction with phenolphthalein, while a strong reaction is obtained after the blood has undergone putrefaction, is explained by the authors as due to the setting free of Cu from organic combination in the course of the decomposition. The reagent also reacts with inorganic ferric salts by giving a rose coloration, 1 part Fe in 500,000 of water giving a positive test in the presence of glycerol or mannite. Chromic salts also give the reaction in concentrations greater than 1 part in 100,000, as do salts of Ni. Salts of Mn give no reaction. The reagent is sensitive to 1 part of Co in 10,000,000 of water, but the rose color does not appear at once, except at greater concentrations. Kastle-Meyer's reagent therefore appears to the authors as more useful in testing for the presence of traces of these metals than as a peroxidase reagent.—*Joseph S. Caldwell.*

3113. TSUCHIHASHI, M. Über die Einwirkung der Metalle auf Pepsin. [The action of metals on pepsin.] *Biochem. Zeitschr.* 140: 149–153. 1923.—Pepsin was inactivated by Zn and Cu. It was less sensitive to Fe and Co and was not affected by Ni, in contrast to soy bean urease which was inactivated by all these metals except Fe.—*H. D. Hooker, Jr.*

3114. ZERNER, ERNST, UND ROBERT HAMBURGER. Über die Einwirkung von Silberverbindungen auf Hefe. [On the influence of silver compounds on yeast.] *Biochem. Zeitschr.* 122: 315–318. 1921.— AgNO_3 , AgCl , and Ag_2CO_3 , but not metallic Ag, are toxic to yeast. There is a limit to the amount of yeast a certain amount of dissolved salt can kill, suggesting that the salt combines with the yeast cells.—*F. G. Gustafson.*

MISCELLANEOUS

3115. BAUDOUIN, A., ET H. BÉNARD. Considérations sur l'application des méthodes optiques à la biologie. Un nouvel appareil (colorimètre, néphélémètre, spectroscope différentiel.) [The application of optical methods in biology. A new apparatus (colorimeter, nephelometer, and differential spectroscopy).] *Bull. Soc. Chim. Biol.* 4: 454–473. 6 fig. 1922.—A full description is given, with illustrations, of an instrument devised by the authors which has the range of uses indicated by the title.—*Joseph S. Caldwell.*

3116. BOUILLOT, J. Appareil de laboratoire permettant de dessécher rapidement les composés organiques sans les altérer. [Laboratory apparatus for rapid drying of organic compounds without alteration.] Bull. Soc. Chim. Biol. 5: 266-269. 1 fig. 1923.—A simple and inexpensive apparatus is described which is said to have given excellent results in drying readily decomposable compounds.—*Joseph S. Caldwell.*

3117. ELVEDEN, RUPERT E. C. L., AND ERIC SINKINSON. Electrolytic generator for pure hydrogen. Jour. Chem. Soc. (London) 123: 2715-2716. 1923.—A description is given of an apparatus for producing a continuous supply of pure H_2 for H-ion concentration measurements. The capacity is 6 l. of H_2 per hour.—*F. E. Denny.*

3118. HALL, F. G. A method for the determination of dissolved carbon dioxide. Jour. Biol. Chem. 55: 751-755. 1923.

3119. HAND, PERCY GEORGE TERRY. Colorimetric estimation of small amounts of oxygen. Jour. Chem. Soc. (London) 123: 2573-2576. 2 fig. 1923.—By means of this method, which was devised for estimating small amounts of O_2 in a stream of gas, it is possible to detect 1.5 parts (by volume) of O_2 in 10 million parts of a gas. The iodine set free from KI in the presence of O_2 and manganous hydroxide is estimated colorimetrically by a starch solution under a standard set of conditions.—*F. E. Denny.*

3120. VEIBEL, STIG. The quinhydrone electrode as a comparison electrode. Jour. Chem. Soc. (London) 123: 2203-2207. 1923.—This electrode, which may be used in some cases to replace the hydrogen electrode in H-ion concentration measurements of acid solutions, is formed by dissolving a small quantity of quinhydrone in the liquid under investigation. There is formed a potential pressure of hydrogen which is constant though feeble. The authors further find that a quinhydrone reference electrode may be prepared which in certain respects is superior to a calomel electrode, being easier to prepare and attaining its potential more quickly. From the standpoint of reproducibility it is equal to the 3.5 N and superior to the 0.1 N calomel electrode. It is not stated whether quinhydrone electrodes can be used with plant tissue extracts.—*F. E. Denny.*

SOIL SCIENCE

A. G. McCALL, *Editor*

(See also in this issue Entries 2135, 2140, 2148, 2153, 2160, 2168, 2171, 2175, 2180, 2185, 2189, 2191, 2202, 2213, 2324, 2330, 2332, 2334, 2339, 2402, 2475, 2591, 2597, 2838, 2840, 2841, 2842, 2940, 3011, 3017, 3078, 3110)

3121. ANONYMOUS. The human element in the work at Rothamsted. Soil Sci. 14: 175-176. 1922.—A brief review is reprinted from the Agricultural Gazette of the reminiscences of Edwin Grey, field superintendent at the Rothamsted Experimental Station.—*W. J. Robbins.*

3122. ARRHENIUS, O. A possible correlation between the fertility of rice soils and their titration curves. Soil Sci. 14: 21-26. 3 fig. 1922.—H-ion concentrations of 43 rice soils from Java show little correlation with their fertility. Rice plants in solutions of HCl or KOH of pH 3.0-9.0 neutralize the acid or alkalies to a pH of 6.2. A distinct correlation between the buffer capacity and the productivity of the soil was found. The use of green manure with lime is suggested to give buffer action to soils.—*W. J. Robbins.*

3123. ARRHENIUS, O. The potential acidity of soils. Soil Sci. 14: 223-232. 1922.—The potential acidity of the soil or the buffer action is correlated in some cases with fertility. A strong buffer action means a good soil, a weak one, a bad or easily changed soil, provided the reaction of the soil lies within certain limits. Humus-manuring and cultivation increase the buffer effect. The titration of soils may be used for the determination of the lime requirement.—*W. J. Robbins.*

3124. BLAIR, A. W., AND A. L. PRINCE. Variation of nitrate nitrogen and pH values of soils from the nitrogen availability plots. Soil Sci. 14: 9-17. Pl. 1, fig. 1-2. 1922.— NO_3 and pH determinations were made at 2-week intervals on plots both limed and unlimed which had received different fertilizer treatments. Yields of barley or hay and the lime requirement by the Veitch method are given. A pH value in the neighborhood of 4.5 indicates a degree of acidity which practically prohibits the growth of ordinary field crops. The pH values

showed only slight variations during the season for a given plot. The average NO_3 contents of the unlimed plots were higher than those of the limed. NO_3 was found in considerable quantities in a soil of pH 4.5.—*W. J. Robbins.*

3125. BROWN, H. D. Sulfonation in pure and mixed cultures with special reference to sulfate production, hydrogen-ion concentration and nitrification. *Jour. Amer. Soc. Agron.* 15: 350-382. 1923.—Factors which control oxidation and effects of S treatment on soils were studied. The S-oxidizing organism isolated resembled *Thiobacillus thio-oxidans*. It possessed strong S-oxidizing power and greatly increased the H-ion concentration of the medium. Crop growth was materially retarded and stunted by S applications of more than 1000 pounds per acre; on unlimed soils this effect was noticeable with 500 pounds of S per acre. The H-ion concentration of a soil may be readily altered by applications of CaCO_3 or of flowers of S.—*F. M. Schertz.*

3126. BURGESS, PAUL S. The soil solution, extracted by Lipman's direct-pressure method, compared with 1: 5 water extracts. *Soil Sci.* 14: 191-215. 2 pl., 4 fig. 1922.—Soil solutions secured by pressure up to 16,000 pounds per square inch were compared with 1 to 5 water extracts of the same fine sandy loams. From 45 to 60 per cent of the water was extracted from the soils moistened to 50 per cent of their moisture-holding capacity. The average amounts of Ca, Mg, and NO_3 dissolved and removed by the 2 methods are practically equivalent. About 3.5 times as much K, 1-7 times as much SO_4 , and over 30 times as much PO_4 was removed by the 1 to 5 extract method as by the pressure method. A definite relationship between the conductivity measurements of soil solutions and those of water extracts was found. The soil solutions were practically neutral while the H-ion concentrations of the soils themselves varied from pH 6.5 to 7.4.—*W. J. Robbins.*

3127. CARTER, W. T., JR., J. O. VEATCH, M. W. BECK, H. V. GEIB, H. C. MORTLOCK, C. E. DEARDORFF, H. W. HAWKER, J. F. STROUD, AND W. B. FRANCIS. Soil survey, Red River County, Texas. Advance Sheets Field Operations Bur. Soils U. S. Dept. Agric. 1919: 153-206. Fig. 1, map (col.). 1923.

3128. CONN, H. J. A microscopic method for demonstrating fungi and Actinomycetes in soil. *Soil Sci.* 14: 149-151. 1922.—Place 10 mgm. or less of soil on a microscopic slide and mix with 2-3 drops of water. Dip a small glass rod into methylene blue solution and mix with the soil. Examination under the microscope shows mycelium present in almost all soils. Actinomycetes filaments are abundant in some soils and entirely lacking in others although plate counts always show large numbers of these organisms. Plate counts of spore-forming organisms give no idea of their activity in the substance under investigation.—*W. J. Robbins.*

3129. FRAZIER, W. C., AND E. B. FRED. Movement of legume bacteria in soil. *Soil Sci.* 14: 29-35. 2 pl., 4 fig. 1922.—Experiments with soy beans in sand indicated that the legume bacteria traveled 0.1-0.2 inch per day.—*W. J. Robbins.*

3130. GILE, P. L. Methods of diagnosing toxicity. *Jour. Amer. Soc. Agron.* 15: 305-312. 1923.—The author discusses whether the reduced growth of plants on certain soils is due to a toxicity of Al salts or to some other condition associated with soil acidity. A specific toxicity of Al ions, which has not yet been established, does not harmonize with the fact that some plants require an acid soil. It is suggested that the beneficial and deleterious effects of soil acidity may be connected with the concentrations of different nutrients available at different pH values.—*F. M. Schertz.*

3131. GORDON, W. E., AND E. B. STARKEY. Influence of soil colloids on availability of salts. *Soil Sci.* 14: 1-7. 1 fig. 1922.—Alumina and iron gels show a large power of absorption for salts like calcium acid phosphate while silica gel shows a small absorption. The colloids give up their adsorbed salts gradually.—*W. J. Robbins.*

3132. HALL, THOS. D. Some Transvaal soils. 1. Investigations on some highly calcareous soils. 2. Soils of the Eastern Transvaal Low Veld. Union South Africa Dept. Agric. Bull. 5. 36 p. 1922.—1. Three main types of Zeerust irrigation soils were investigated; a red loam; a grey, highly calcareous loam; and a dark brown to black, calcareous clay loam. All 3 types are benefited by a crop rotation including a legume, and by the use of phosphates. The black turf shows a potash deficiency. 2. The arable soils of the greater portion of the Barberton district are chiefly of granitic origin, the 2 main types being a grey, coarse, sandy

loam and a red loam. From the physical point of view some of the low-lying soils are badly in need of drainage. Many of the soils are deficient in organic matter and thus in water-holding capacity. The chief mineral deficiency is in phosphates, but some of the soils are also deficient in potash.—*E. M. Doidge*.

3133. HALL, THOS. D. **Valuable peaty soils.** Jour. Dept. Agric. Union South Africa 6: 504-510. 2 fig. 1923.—In southwestern Transvaal where an impervious quartzite layer, the Black Reef, underlies the dolomite, there are large areas of peat, due to quondam lakes and swamps. The nature and composition of these peats and suitable crops are discussed. These peat soils are very rich in phosphates, nitrogen, potash, and lime. Potatoes appear to be the best crop for this soil type, phenomenal yields having been obtained.—*L. J. Goldblatt*.

3134. HAYES, F. A., L. S. PAINE, D. L. GROSS, AND O. M. KRUEGER. **Soil survey, Madison County, Nebraska.** Advance Sheets Field Operations Bur. Soils U. S. Dept. Agric. 1920: 201-248. Fig. 7, map. (col.). 1923.

3135. JOFFE, J. S., AND H. C. McCLEAN. **A note on the oxidation of sulfur in Oregon soils.** Soil. Sci. 14: 217-221. 1922.—The sulphur-oxidizing capacity of 8 Oregon soils was investigated. Most of these soils did not materially change in reaction after having oxidized most of the sulphur applied. Inoculated sulphur proved more effective than the uninoculated form.—*W. J. Robbins*.

3136. KELLEY, W. P. **Variability of alkali soil.** Soil Sci. 14: 177-189. 4 fig. 1922.—Analyses for alkali salts in soils near Fresno, California, show in samples taken only 2 feet apart a difference of more than 600% in chloride and 1000% in sulphate content. One sample from an experimental plot contained practically no alkali salts, while other samples contained high concentrations. The character of the vegetation probably affords the safest guide in sampling an alkali soil.—*W. J. Robbins*.

3137. KRUSEKOPF, H. H., AND H. I. COHN. **Soil Survey, Knox County, Missouri.** Advance Sheets Field Operations Bur. Soils U. S. Dept. Agric. 1917: 5-32. Pl. 1, fig. 1, map (col.). 1921.—Located in northeastern Missouri, Knox County typically represents the level to gently rolling prairie of the region. While small areas along the streams are broken, the county in the main is well fitted for extensive agriculture; 95% of the area is tillable.—The annual rainfall is about 39 inches, well distributed through the year. The winters are mild, the snowfall being about 15 inches. The growing season is 6 months, the summers being long but not extremely hot.—Almost $\frac{1}{2}$ of the county is covered by loess, a wind-blown silty soil. The weathering of this deposit has yielded extremely valuable soils, most important of which is the Grundy silt loam. Its surface is black and about 12 inches in depth with a brown to drab subsoil of heavier texture. It is well supplied with nitrogen but is deficient in phosphoric acid as indicated by fertilizer tests.—About 35% of the county is covered by soils arising from the weathering of the original Kansan till. The Shelby loam is the most extensive type of this group. While this soil is variable, it normally has a very dark brown surface with a brown sub-surface of a heavier nature. The topography of this soil is rolling due to erosion. It is highly improved land, corn and grass being the principal crops.—Due to the presence of numerous small streams about 17% of the soil area of the county is alluvial. The Wabash silt loam is the most important bottom-soil of the region; it has a black surface soil which becomes heavier with depth, and at about 15 inches it changes to a drab silty clay. This soil contains an abundance of organic matter and lime and is one of the strongest of the county. It is, however, subject to occasional overflow.—Associated with the first bottom soils are smaller areas of terrace or second-bottom, which makes up about 3% of the county.—The agriculture of the county is highly developed and is characteristic of the southern corn belt. The farm units are large and the farming extensive. The principal crops in order are corn, grass and hay, oats, and wheat. Livestock is an essential part of the farming system, but dairying is as yet unimportant.—While rotation of crops is practiced it is not usually systematic. Clover is grown but not as often nor in as large areas as would be advisable from the standpoint of good soil management. Most of the upland soils and terrace areas are acid and respond to lime and phosphorus. Farm manure is the principal fertilizer although some acid phosphate is applied.—*H. O. Buckman*.

3138. LIVINGSTON, BURTON E. **Some physiological aspects of soil toxicity.** Jour. Amer. Soc. Agron. 15: 312-323. 1923.—Soil toxicity as an environmental condition, and toxic substances of the soil and their origin, are discussed. Most toxic soils may be benefitted by subterranean drainage and increased aeration.—*F. M. Schertz.*

3139. MCCALL, A. G. **The influence of acidity itself on plant growth without regard to other factors.** Jour. Amer. Soc. Agron. 15: 290-297. 1923.—Many crops make satisfactory growth on soils regarded as acid, and such plants as blueberry and Rhododendron require an acid medium. Certain crops, such as potatoes, become diseased when grown in soil which approaches neutrality.—*F. M. Schertz.*

3140. POWERS, W. L. **Field moisture capacity and wilting point of soils.** Soil Sci. 14: 159-165. 1 fig. 1922.—The average water content of a silty clay loam in pots at the wilting point of the plant was for clover 16%, potatoes 17.5% and beets 20.3%. A figure showing the hygroscopic coefficient, wilting coefficient moisture, equivalent, saturation point, and field moisture capacity for different soils is given.—*W. J. Robbins.*

3141. ROST, CLAYTON O. **Occurrence of sulfides in Minnesota peat soils.** Soil Sci. 14: 167-174. 1922.—Sulphides are found generally in peat soils from northwestern Minnesota. Expressed as H_2S , 19 samples of peat and muck showed a maximum of 0.060 and a minimum of 0.016% for the lowest layer of peat and 0.013 and 0.002% for the muck immediately below. In northeastern Minnesota sulphides are much less common.—*W. J. Robbins.*

3142. RUDOLFS, W. **Composting rock phosphate with sulfur in slightly alkaline calcareous soils.** Soil Sci. 14: 37-59. 3 fig. 1922.—The object of this study was to determine how to shorten the incubation period for available phosphorus in composts of rock phosphate, sulphur, and calcareous, slightly alkaline soil. Sulphur oxidation took place in a calcareous, slightly alkaline soil. A temperature of 30°C. increased the relative acidity and available phosphorus while light was slightly detrimental. Small quantities of H_2SO_4 stimulated bacterial activity, while an abundance of air almost inhibited sulphur oxidation.—*W. J. Robbins.*

3143. RUDOLFS, W. **Oxidation of iron pyrites by sulfur-oxidizing organisms and their use for making mineral phosphate available.** Soil Sci. 14: 135-147. Pl. 1. 1922.—Iron pyrites can be attacked by micro-organisms and changed into the sulphate form, the change being accelerated by the presence of small quantities of sulphur. Pyrites composted with sulphur and rock phosphate do not interfere with the increase in availability of the phosphoric acid. The replacement of a part of the soil with ammonium sulphate in composts containing rock phosphate, sulphur, and iron pyrites produced a marked increase in the available phosphoric acid. Aeration of sulphur-pyrites-rock phosphate compost mixtures by a continuous stream of air had no effect on available phosphate, in the absence of ammonium sulphate.—*W. J. Robbins.*

3144. SCHREINER, OSWALD. **Toxic organic soil constituents and the influence of oxidation.** Jour. Amer. Soc. Agron. 15: 270-276. 1923.—Toxic substances which have been found in unproductive soils are: picoline carboxylic acid, dihydroxystearic acid, oxalic acid, salicylic aldehyde, and vanillin. The most useful agents for combating toxic substances or preventing their accumulation are: better drainage, liming, crop rotation, green manuring, and fertilization.—*F. M. Schertz.*

3145. STEWART, JOHN. **Some relations of arsenic to plant growth.** Soil Sci. 14: 111-118. 119-126. 2 fig. 1922.—Only 3 parts of arsenic dissolve from lead arsenate in a million parts of water. Sulphates and nitrates are without effect while acid salts and those which hydrolyze with an alkaline reaction increase the solvent action of water on lead arsenate. The soil solution dissolves more lead arsenate than does pure water. Disodium arsenate applied to soil in pots at 9 intervals during the growth of peas, radishes, wheat, potatoes or beans, gave a slight stimulating effect at low concentrations.—*W. J. Robbins.*

3146. SWEET, A. T., H. W. HAWKER, E. W. KNOBEL, AND J. B. FEHSENFELT. **Soil Survey, Lincoln County, Missouri.** Advance Sheets Field Operations Bur. Soils U. S. Dept. Agric. 1917: 5-41. Pl. 1-3, fig. 1, map (col.). 1920.

3147. VANDECAVEYE, S. C. **The effect of certain potassium fertilizers on ammonification, nitrification and crop production.** Jour. Amer. Soc. Agron. 15: 415-427. 1923.—The application of manure and lime stimulated the ammonifying and nitrifying power of Carrington loam

but manure alone caused a slight depression in ammonification. K salts, such as KCl, K₂SO₄, and kainit, resulted in large increases in nitrification but exerted only little influence upon ammonification. Treatments which stimulated the ammonifying and nitrifying powers also resulted in decided increases in citrate-soluble and water-soluble K, showing that there existed a definite relationship between bacterial activities and the citrate- and water-soluble K. Applications of manure increased the citrate-soluble P, but the addition of K fertilizers were without effect. The use of K fertilizers alone produced increased yields in the wheat crop but no appreciable increases in the clover crops, while kainit seemed to exert a toxic effect upon clover. Decaying organic matter and bacterial activities either separately or combined exerted a striking influence on the liberation of K.—*F. M. Schertz.*

3148. WAKSMAN, S. A. Microbiological analysis of soil as an index of soil fertility: I. The mathematical interpretation of numbers of micro-organisms in the soil. *Soil Sci.* 14: 81-101. 1922.—Probable errors should be determined for the number of microorganisms determined in different samples.—*W. J. Robbins.*

3149. WAKSMAN, S. A. The growth of fungi in the soil. *Soil Sci.* 14: 153-157. 1922.—A method for demonstrating fungus mycelium in the soil is described. A lump of soil is placed in the center of a Petri dish containing sterile nutrient agar. The mycelium growing out of the lump after 24 hours' incubation is believed to come from mycelium and not from spores. Two acid agars are described for determining the fungi in soil. Evidence is presented to show that fungi are important in the biological processes in soils.—*W. J. Robbins.*

3150. WAKSMAN, S. A., AND E. B. FRED. A tentative outline of the plate method for determining the number of micro-organisms in the soil. *Soil Sci.* 14: 27-28. 1922.—The authors, as a committee of the Society of American Bacteriologists, for the sake of uniformity of methods in soil bacteriology propose the following outline: composition of media, reaction, preparation and sterilization, sampling of soil and dilutions, incubation, counting of plates, mathematical interpretation of results, maximum error, types of colonies. Some specific media and methods are given.—*W. J. Robbins.*

3151. WHITING, ALBERT L. Inorganic substances, especially aluminum, in relation to the activities of soil microorganisms. *Jour. Amer. Soc. Agron.* 15: 277-289. 1923.—The paper summarizes the recent work on aluminum which has been done in the U. S. A. Al has not yet been shown to be a suitable base for the nitrification process, but soluble Al may be present where bacterial oxidation of S is in progress. The influence of Al as a toxic to soil organisms does not appear to be important when optimum amounts of P, K, and Ca are present.—*F. M. Schertz.*

3152. WILSDON, B. H., AND ALI BARKAT. Nitrogen fixation in arid climates. *Soil Sci.* 14: 127-133. 1 fig. 1922.—A comparison of the N removed by crops in the Punjab and the N added in manure shows that about 38 pounds of N per acre per year is secured through natural processes of fixation. Pot experiments show that not until after a prolonged period of dry heat does the soil become capable of considerable N fixation.—*W. J. Robbins.*

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

GENERAL

(See also in this issue Entries 2162, 2223, 2234, 2248, 2255, 2285, 2323, 2349, 2351, 2366, 2373, 2436, 2441, 2458, 2491, 2507, 2606, 2625, 2669, 2714, 2906)

3153. HORNIBROOK, MURRAY. Dwarf and slow-growing conifers. *Small 8 vo, x + 195 p., photo. illus. 25.* "Country Life" Ltd. and George Newnes: London; Charles Scribner's Sons: New York, 1923.—Descriptions are given, arranged alphabetically according to the genus, of approximately 460 forms of dwarf-conifers commonly used in arboriculture or noted as new. The discussion is limited to "natural dwarf-sports or seedlings of arborescent trees." The following varieties are evidently described as new: *Abies amabilis* (Loud.) Forbes var. *com-*

pacta; *Cephalotaxus pedunculata* Sieb. & Zucc. var. *prostrata*; *Chamaecyparis Lawsoniana* (Murr.) Parl. vars. *tamariscifolia*, *milfordensis*, and *knowefieldensis*; *C. obtusa* Sieb. & Zucc. vars. *nana aurea*, *nana prostrata*, *tetragona minima*, *caespitosa*, and *juniperoides*; *C. pisifera* Sieb. & Zucc. vars. *squarrosa intermedia*, *squarrosa minima*, and *nana aureo-variegata*; *Cryptomeria japonica* Don. vars. *nana albo-spicata* and *globosa nana*; *Cupressus macrocarpa* Hartw. var. *compacta*; *Juniperus chinensis* L., vars. *globosa*, *albo-variegata*, *decumbens albo-variegata*, *decumbens aureo-variegata*; *J. communis* L. vars. *aurea* and *nana aurea*; *J. squamata* Buch.-Hamilton var. *prostrata*; *Picea excelsa* Lk. vars. *brevifolia argentea*, *knaptonensis*, *pachyphylla*, *Maxwelli*, *pseudo-Maxwelli*, *hystrix*, *prostrata*, *decumbens*, *Sargenti*, *diffusa*, *spathulifolia*; *P. nigra* Lk. var. *pendula variegata*; *P. pungens* Engl. var. *Hunnewelliana*; *P. rubra* Lk. var. *crista-galli*; *P. sitchensis* (Bong.) Traut. & Mayer var. *microphylla*; *Pinus Laricio* Poir. var. *Moseri*; *P. Strobis* L. vars. *radiata ad minima*; *P. sylvestris* L. var. *pyramidalis compacta*; *Pseudolarix Kaemferi* Gord. vars. *Dawsoni* and *Annesleyana*; *Pseudotsuga Douglasi* Carr. vars. *Fletcheri* and *leptophylla*; *P. glauca* Meyr. var. *nana*; *Thuja occidentalis* L. vars. *minima* and *caespitosa*; *T. orientalis* L. vars. *aurea*, *minima glauca*, *Rosedalis compacta*; *T. plicata* Donn var. *Hillieri*; *Tsuga caroliniana* Engelm. var. *compacta*. The following are evidently new combinations or new names for forms already described: *Abies lasiocarpa* Nutt. vars. *conica* (var. *compacta* Rehder, not Beiss.) and *compacta* (Beiss.); *Chamaecyparis obtusa* Sieb. & Zucc. var. *tetragona* (Barron); *Juniperus chinensis* L. var. *Sheppardi* (Kent); *J. chinensis* L. vars. *decumbens*, *plumosa*, *plumosa aurea*; *Picea excelsa* Lk. var. *brevifolia* (Cripps); *P. excelsa* Lk. var. *Clanbrasiliensis stricta* (Loud.); *P. excelsa* Lk. var. *Gregoriana* (Gord.); *Pseudotsuga Douglasi* Carr. var. *pygmacea*; *P. glauca* Mayr. var. *pumila* (Beiss.); *Sequoi sempervirens* Endl. var. *nana pendula*; *Taxus baccata* L. var. *cheshuntensis*; *Thuja orientalis* L. var. *filiformis* Henk. & Hochst. forma *stricta* (Endl.). The following forms are described as new: *Juniperus sabina* L. var. *humulus* Endl. f. *aurea variegata*; *Picea excelsa* Lk. var. *Gregoriana* Gord. f. *Veitchii* and f. *Parsonii*; *Thuja occidentalis* L. var. *ericoides* Kent f. *Watereri*.—*Carl Epling*.

3154. MAXWELL, HERBERT. Greek orthography in scientific names. *Nature* 112: 502. 1923.—The writer notes the difficulty of preserving the orthography and cites *Chionanthus* and *Chimonanthus*. The latter should be *Cheimonanthus*.—*O. A. Stevens*.

3155. OLMSTED, FREDERICK LAW, FREDERICK V. COVILLE, and HARLAN P. KELSEY. Standardized plant Names. A catalogue of approved scientific and common names of plants in American commerce. *Small 8 vo*, xvi + 546 p. American Joint Committee on Horticultural Nomenclature; Salem, Massachusetts, 1923.—The aim of this work, as expressed in the preface, is to bring "about, so far as practicable, the consistent use of a single standardized scientific name, and a single standardized common name for every tree, shrub, and plant in American commerce."—*J. M. Greenman*.

3156. SMITH, HURON H. Ethnobotany of the Menomini Indians. *Bull. Publ. Mus. Milwaukee* 4: 1-174. *Pl.* 1-36. 1923.—In recording the various uses of plants made by the Menomini Indians the author gives extended lists of plants which comprise a considerable part of the flora of Shawano County in northeastern Wisconsin. English, Latin, and Indian names are placed in juxtaposition.—*J. M. Greenman*.

PTERIDOPHYTES

3157. BOWER, F. O. The Ferns (Filicales) treated comparatively with a view to their natural classification. Vol. I. viii + 359 p., 309 fig. Cambridge University Press: London, 1923.—The author's aim is to construct a phyletic arrangement of the ferns which shall set forth as accurately as possible their true evolutionary relationships, and thereby to illustrate methods applicable to other groups. To this end the possible criteria of comparison, on which such a system must be based, and the fossil evidence by which it must be checked, are in this volume critically considered. The actual building up of the system is deferred to a 2nd volume. Habit and leaf-form are rejected as at once too uniform in essentials and too plastic in detail to afford reliable evidence of relationship or age. Even the simple leaf-structure of the Hymenophyllaceae is regarded as a direct adaptation to strongly hygrophytic conditions. The remaining criteria are as follows: (1) external morphology of the shoot; (2) initial constitution of the plant-body as indicated by segmentation; (3) architecture and venation of the

leaf; (4) vascular system of the shoot; (5) dermal appendages; (6) position and structure of the sorus; (7) indusial protections; (8) characters of the sporangium and form and marking of the spores; (9) spore-output; (10) morphology of the prothallus; (11) position and structure of the sexual organs; (12) embryology of the sporophyte. These are examined in detail and primitive forms distinguished where possible. The following conditions, more or less useful in phyletic arrangement, are regarded as primitive: (a) upright, simple, radial shoot (root-stock), bearing leaves in acropetal succession; (b) equal dichotomy in branching, whether of shoot, leaf-axis, or venation. In the last, frequent progressions from primitive to advanced states within narrow circles of affinity indicate that characters drawn from it must be used with caution; (c) irregular segmentation from apical cells in growth, and massive structures associated with it; (d) that form of vascular system which in the adult stage most nearly resembles the protosteles. Characters of the vascular system are valuable because of their conservatism; but homoplastic developments, sometimes purely dependent on size, indicate that these characters taken alone do not constitute reliable indications of affinity; (e) simple hairs, as against flattened scales; (f) simple sori (i.e., with sporangia solitary or in rosettes, simultaneously developed, as in the Gleicheniaceae, as against graded (sporangia developed in basipetal succession on an elongate receptacle, as in the Hymenophyllaceae) and mixed (sporangia of all ages indiscriminately mingled, as in most Polypodiaceae); (g) distal or marginal position of the sori; (h) massive sporangia with only slightly differentiated ring, or short-pedicelled sporangia. Structures of the sporangia are correlated with, and often adapted to, the form of the sorus; (i) transverse, as against vertical, annulus; (j) large output of spores per sporangium; (k) filamentous gametophyte (rarely found except in juvenile states and as an adaptation to crowded conditions); (l) large output of spermatozoids per antheridium. In general, conclusions to be valid must be based on the sum of all the characters of a given group, and the possibility of the development of like characters by like stages in different phyletic lines must always be borne in mind. The Eusporangiatæ are more primitive than the Leptosporangiatæ. The arrangement employed by Mettenius, if reversed so as to stand Ophioglossaceae, Marattiaceae, Osmundaceae, Schizaeaceae, Gleicheniaceae, Hymenophyllaceae, Cyatheaceae, Polypodiaceae, gives an essentially correct evolutionary sequence. Surprise is expressed that it was ever abandoned in favor of the more artificial arrangements in current use.—C. A. Weatherby.

SPERMATOPHYTES

3158. ANONYMOUS. **New species from Mount Everest.** Kew Bull. 1922: 149-155. 1922.—The plants were collected in Tibet between May and September, 1921, by A. F. R. Wollaston, medical officer and naturalist to the Mount Everest Expedition. The following species are described: *Aconitum ochrochryseum* Stapf, *Tanacetum khartense* Dunn, *Androsace sessiliflora* Turrill, *Primula buryana* Balf. f., *P. wollastonii* Balf. f., *P. younghusbandiana* Balf. f., *Gentiana stellata* Turrill, *G. tubiflora* Wall. var. *longiflora* Turrill, and *Dracocephalum breviflorum* Turrill.—T. J. Fitzpatrick.

3159. AMES, OAKES. **Orchidaceae quaedam Americanae.** [Some American orchids.] Schedulae Orchidianae No. 1. P. 1-24. Nov. 18, 1922.—The 1st number of this new publication, which deals exclusively with orchids, contains descriptions of the following new species: *Gomphichis foliosa*, Colombia; *Physosiphon cooperi*, Costa Rica; *Stelis chihobensis*, Guatemala; *S. colombiana*, *S. vagans*, *S. insignis*, Colombia; *S. longipetiolata*, Panama; *S. perplexa*, Guatemala; *Pleurothallis araguensis*, Venezuela; *P. poasensis*, *P. rowleei*, Costa Rica; *Lepanthes mirabilis*, Colombia; *Epidendrum alanjense*, *E. colonense*, Panama; *E. diguetii*, *E. pruinosum* Rich. & Gal., Mexico; *E. magnibracteatum*, Costa Rica; *E. neurosum*, Guatemala; *E. pittieri*, *E. suaveolens*, Colombia; *E. steinbachii*, Bolivia; and *Elleanthus towarensis*, Venezuela.—Ibid. No. 2. P. 1-38, pl. 1. Jan. 6, 1923.—The present article in this series consists of critical notes on little-known tropical American orchids and descriptions of the following new species: *Pelexia hondurensis*, Honduras; *P. subaequalis*, Guatemala; *Spiranthes amabilis*, Guatemala; *Sarcoglottis hemichrea* (*Spiranthes hemichrea* Lindl.), *S. orbiculata*, *S. zamororae*, Guatemala; *S. pubilabia*, Mexico; *S. valida*, Costa Rica; *Stelis trinitatis*, Trinidad; *Pleurothallis abjecta*, *P. jocolensis*, *P. johnsonii*, *P. samacensis*, Guatemala; *P. canae*, Panama;

P. Schlechteriana (*P. costaricensis* Schltr., not Rolfe); *Lepanthes Johnsonii*, *L. samacensis*, Guatemala; *Epidendrum benignum*, *E. ichthyophyllum*, *E. pachyrachis*, *E. prorepens*, Guatemala; *E. palmense* (*E. magnibracteatum* Ames, not Kränzl.); *E. obesum*, Costa Rica; *Maxillaria trinitatis*, Trinidad; and *Ornithidium Pittieri*, Costa Rica.—J. M. Greenman.

3160. AMES, OAKES. New or noteworthy orchids. *Schedulae Orchidiana* No. 3. P. 1-27. Jan. 30, 1923.—Critical notes are recorded on *Epidendrum Chloë* Reichb. f., *E. cnemidophorum* Lindl., *E. ionophlebium* Reichb. f., *E. luteoroseum* Rich. & Gal., *E. Ovulum* Lindl., *E. pentotis* Reichb. f., *E. propinquum* Rich. & Gal., *E. Rousseauae* Schltr., and *E. volutum* Lindl. The following new species are described: *Stelis cuspidata*, *S. glandulosa*, *S. Lankesteri*, *Pleurothallis cucullata*, *P. dentipetala*, *P. hamata* Rolfe, Costa Rica; *Lepanthes appendiculata*, Guatemala; *L. fimbriata*, Costa Rica; *L. gibberosa*, Guatemala; *Zygopetalum trinitatis*, Trinidad; *Bulbophyllum lipense*, Philippine Islands; *Telipogon Lankesteri* and *Ornithochephus Lankesteri*, Costa Rica.—J. M. Greenman.

3161. AMES, OAKES. Additions to the orchid flora of Central America with observations on noteworthy species. *Schedulae Orchidiana* No. 4. P. 1-60, pl. 2-3, 3 fig. May 4, 1923.—The present paper records important observations on several hitherto imperfectly known orchids and includes descriptions of the following new species, mostly from Costa Rica: *Habenaria Lankesteri*, *Lankesterella* n. gen., *L. costaricensis*, *Cranichis Lankesteri*, *C. saccata*, *Malaxis Lankesteri*, *Cryptophoranthus Powellii*, *Masdevallia panamensis* (*Scaphosepalum panamensis* Schltr.), *Stelis cascajalensis*, *S. inaequalis*, *S. Sanchoii*, *Pleurothallis amethystina*, *P. arietina*, *P. cachensis*, *P. cedralensis*, *P. cerea*, *P. crescentilabia*, *P. glomerata*, *P. Nelsonii*, *P. pergrata*, *P. saccata*, *P. Sanchoii*, *Lepanthes cascajalensis*, *L. Chameleon*, *L. estrellensis*, *L. micrantha*, *L. tridens*, *L. Sanchoii*, *Epidendrum amandum*, *E. crescentilobum*, *E. cristobalense*, *E. equitantiifolium* (*E. equitans* Lindl., not Ruiz & Pav.), *E. estrellense*, *E. exile*, *E. Lankesteri*, *E. peraltense*, *E. Sanchoii*, *E. santaclarense*, *E. vestitum* (*E. Porpax* Reichb. f. in *Flora* 48: 278. 1865, not Reichb. f. in *Bonpl.* 3: 220. 1855). *Ornithidium Lankesteri*, *Oncidium Lankesteri*, *Chondrorhyncha estrellensis*, *Dichaea Lankesteri*, and *Campylocentrum Lankesteri*.—J. M. Greenman.

3162. AMES, OAKES. New or noteworthy orchids from Central America and the Philippine Islands. *Schedulae Orchidiana* No. 5. P. 1-42, 6 fig. June 6, 1923.—The author records the results of further study of the Central American and Philippine orchid flora. Important data are recorded on several previously published species. The following new species, combinations, and names are included: *Malaxis aurea*, *Masdevallia linearifolia*, *Pleurothallis alpina*, *P. praegrandis*, *P. scandens*, *Lepanthes eximia*, *L. rostrata*, *Epidendrum bisulcatum*, *E. cobanense*, *Trigonidium Lankesteri*, *Notylia Lankesteri*, *Lockhartia Lankesteri*, and *Campylocentrum hondurens* from Central America; *Acoridium montanum* (*A. linearifolium* Ames, not Rolfe), *A. rhombophorum* (*Coelogyne rhombophora* Reichb. f.), *A. saccolabium* (*Dendrochilum saccolabium* Kränzl.), *Appendicula irigensis*, *A. polyantha*, *Eria Tylori*, and *Sarcochilus zamboangensis* from the Philippine Islands.—J. M. Greenman.

3163. AMES, OAKES. New or noteworthy orchids. *Schedulae Orchidiana* No. 6. P. 1-99, 12 fig. Nov. 3, 1923.—The present paper embraces critical notes on previously known orchids, descriptions of new species, and the synonymy of new names and combinations. The names new to science are: *Tetramicra simplex*, Cuba; *Malaxis Mazonii*, *Stelis cucullata*, *S. distantiflora*, *S. eximia*, *S. propinqua*, *S. vestita*, *Pleurothallis dichotoma*, *P. geminicaulina*, *P. glanduliflora*, *S. eximia*, *S. propinqua*, *S. vestita*, *Pleurothallis dichotoma*, *P. geminicaulina*, *P. glanduliflora*, *P. gnomonifera*, *P. monstrabilis*, *P. peperomioides*, *P. peraltensis*, *P. peregrina*, *P. propinqua*, *P. vinacea*, *Epidendrum pucidum*, *E. rugosum*, *E. simulacrum*, and *E. vagans*, from Central America; *Habenaria intrudens* (*H. lacertifera* Ames, not Benth.), *Galeola philippinensis*, *Aphyllorchis halconensis*, *Erythroides Boettcheri*, *Adenostylis philippinensis*, *A. zamboangensis*, *Epipactis Elmeri*, *E. Ramosii* (*Goodyera Ramosii* Ames), *Hetaeria leytenensis*, *Myrmechis perpusilla*, *Tropidia Robinsonii*, *Coelogyne candoonensis*, *Acoridium exasperatum*, *A. marginatum*, *A. mindanaense*, *A. Serratoi*, *Dendrochilum pangasinanense*, *Malaxis atrosanguinea*, *M. bulusanensis*, *M. epiphytica*, *M. micrantha* (*Microstylis micrantha* Hook. f.), *M. lilacina*, *Lipularis bontocensis*, *L. palawanensis*, *Oberonia Reilloi*, *Podochilus hystericinus*, *Appendicula cuneata*, *A. leytenensis*, *Agrostophyllum Elmeri*, *Ceratostylis Elmeri*, *C. mindanaensis*, *Dendrobium agusanense*, *D. pterocarpum*, *Bulbophyllum colubrimodum*, *B. exquisitum* (*B. MacGregorii*

Ames, not Schltr.), *B. filicoides*, *B. glandulosum*, *B. marcidum*, *B. pampangense*, *B. subaequale*, and *Robiquetia pantherina* (*Saccolabium pantherinum* Kränzl.) from the Philippine Islands.—J. M. Greenman.

3164. ASHE, W. W. Further notes on trees and shrubs of the southeastern United States. Bull. Torrey Bot. Club 50: 359-363. 1923.—*Vaccinium carolinianum*, *Castanea Margaretta*, *C. ozarkensis*, *C. arkansana*, *Robinia pauciflora*, and *R. albicans* are described as new species and *Celtis laevigata apposita* as a new variety.—P. A. Munz.

3165. BAILEY, L. H. Certain cultivated Rubi. Gentes Herbarum 1: 139-200. Fig. 62-90. 1923.—The enumeration of the cultivated Rubi is preceded by a general statement concerning previous publications on cultivated Rubi and on the Rubi native of North America. The arrangement of the enumeration is systematic; the species, 73 in number, are assembled in groups and provided with keys for their determination; the critical and the more important species are discussed at length in regard to their taxonomic relationship, their history and nomenclatural status; many of the critical species are figured, the figures representing mostly type specimens. The following names, combinations, and species are new: *Rubus probus*; *R. loganobaccus*; *R. flagellaris* Willd. vars. *roribaccus* (Bailey), *invisus* (Bailey), *michiganensis* (Card); *R. velox*; *R. mississippianus*; *R. continentalis* (Focke); *R. hispidus* L. var. *Blanchardianus*; *R. probabilis*; *R. alumnus*.—Alfred Rehder.

3166. BAILEY, L. H. Various cultigens, and transfers in nomenclature. Gentes Herbarum 1: 113-136. Fig. 51-61. 1923.—In the introductory remarks to this paper the author shows the necessity for those interested in the taxonomy of cultivated plants and in their classification to apply to cultigens, i.e., groups of plants originated under cultivation and not referable to feral types, binomial designations corresponding to those given to botanical species. For plants of horticultural origin and referable to a species or its equivalent the term cultivar is proposed. The enumeration of cultigens and transfers contains also names previously published, but repeated here for convenient reference, besides the following new names and combinations: *Tulipa Gesneriana* L. var. *Darwinia*; *Canna generalis*; *C. orchiodes*; *Portulaca oleracea* L. var. *gigantes*; *P. pilosa* L. var. *hortualis*; *Lathyrus odoratus* L. var. *nanellus*; *Phaseolus vulgaris* L. var. *nonscandens*; *P. lunatus* L. vars. *lunonanus*, and *salicis*; *P. limensis* Macf. var. *limenanus*; *P. coccineus* L. vars. *rubronanus*, *albiflorus*, and *albonanus*; *Vitis Labruscana*; *Begonia Rex-cultorum*; *B. nigricans* (Hort); *B. rubellina*; *B. Dregei* var. *Macbethii* (Hort.); *Quamoclit Sloteri* House; *Capsicum frutescens* L. vars. *cerasiforme* (Mill.), *conoides* (Mill.), *fasciculatum* (Sturt.), *longum* (Sendt.), and *grossum* (Sendt.); *Pseuderanthemum atropurpureum* (Bull); *P. kewense* (Hook.); *Rudbeckia laciniata* L. var. *hortensia*; *Pityrogramma calomelanos* Link var. *aureo-flava* (Hook.) Weatherby; *Platycereumbifurcatum* C. Chr. var. *majus* (Moore) Weatherby; *Holcus virgatus* (Hack.); *H. sudanensis* (Piper); *H. Sorghum* vars. *saccharatus* (L.), *technicus* (Koern. & Wern.), *Roxburghii* (Hack.), *Durra* (Forsk.), *caffrorum* (Thunb.), and *caudatus* (Hack.); *Setaria italica* vars. *stramineofructa* (Hubbard), *rubrofructa* (Hubbard), and *nigrofructa* (Hubbard); *Aspris capillaris* Hitch. var. *pulchella* (Link); *Triticum aestivum* L. vars. *monococcum* (L.), *dicoccum* (Schränk), and *Spelta* (L.); *Hosta japonica* var. *tardiflora* (Nash); *H. undulata* (Otto & Dietr.); *Kochia scoparia* Schrad. var. *trichopila* (Schinz & Thell.); *Amaranthus tricolor* L. var. *angustior* (Bailey); *A. hybridus* L. var. *hypochondriacus* (L.); *Ribes sativum* Syme var. *macrocarpum* (Jancz.); *Pyrus Dawsoniana* (Rehd.); *Amelopsis brevipedunculata* Koehne vars. *critrulloides* (Lebas) and *elegans* (Koch); *Parthenocissus quinquefolia* Planch. var. *vitacea* (Hitch.); *Ipomoea Nil* Roth var. *limbata* (Hort.); *Cestrum fasciculatum* Miers var. *Newelli* (Veitch); *Cymbalaria pilosa* (DC.); *Mimulus longiflorus* (Nutt.) Grant; *M. leptanthus* (Nutt.) Grant; *Jacobinia obtusior* (Nees).—Alfred Rehder.

3167. BLAKE, S. F. New American Connaraceae. Bull. Torrey Bot. Club. 50: 273-275. 1923.—*Connarus megacarpus* from British Guiana, *Rourea adenophora* and *R. Pittieri* from Panama are described as new species.—P. A. Munz.

3168. BROWN, N. E., ET AL. Diagnoses africanæ: LXXV. Kew Bull. 1922: 27-32. 1922.—The following species are delimited and proposed as new: *Crotalaria Hislopii* Corbishley, southern Rhodesia; *C. Breyeri* N. E. Brown, Transvaal; *Erythrophleum lasianthum* Corbishley, Natal; *Pteronia Foley* Hutchinson & Phillips, Wittebergen; *Acocanthera longiflora* Stapf,

Kenya Colony; *Brachystelma brevipedicellatum* Turrill, Pretoria; *Huernia Hislopii* Turrill, Rhodesia; *Bowkeria citrina* Thode, Natal; *Acrocephalus erectifolius* N. E. Brown, northwest Rhodesia; *Englerastum rhodesianum* N. E. Brown, northern Rhodesia.—*T. J. Fitzpatrick.*

3169. COOK, O. F. *Pseudophoenix insignis*, a new palm from Haiti, and two other new species from the West Indies. Jour. Washington [D. C.] Acad. Sci. 13: 397-408. Fig. 1. 1923.—To *Pseudophoenix*, formerly considered monotypic, 3 new species from the West Indies have been added: *P. insignis*, Haiti; *P. saonae*, Island of Saona at the southeast extremity of the Dominican Republic; *P. linearis*, Cuba. Descriptions of these species are presented, and a discussion of the habits and uses of *P. insignis* is included.—*Helen M. Gilkey.*

3170. CRAIB, W. G. Contributions to the flora of Siam. Kew Bull. 1922: 165-174. 1922.—The following species are characterized as new: *Tetracera Loureiri* Pierre, *Manglietia Garretii*, *Michelia Kerrii*, *Canangium fruticosum*, *Goniolthalamus Marcavii*, *G. desmoides*, *Mitrephora Collinsae*, *Sphaerocoryne clavipes*, *Melodorum affine*, *Alphonsea lutea* Hook. f. & Thoms, var. *longipes*, *Capparis auricans*, *C. mekongensis* Gagnep. var. *crispata*, *Euonymus auriculatus* *Crotalaria Kerrii*, *Indigofera changensis*, *Desmodium rufihirsutum*, *Itea puberula*, *Ehretia Winitii*, *Chirita tubulosa*, *Radermachera Pagetii*, and *Cinnamomum (Camphora) siamense*. Notes on habitat, distribution, local names, synonymy, etc., are given.—*T. J. Fitzpatrick.*

3171. DEBBARMAN, P. M. A critical note on *Crotalaria madurensis* W. and *C. candicans* W. & A. Jour. Indian Bot. Soc. 3: 292-295. 1923.—These two plants of peninsular India were considered as distinct species by all writers till 1876; subsequent authors have tended to unite them as a single species. J. S. Gamble in 1915 separated them again. From an examination of herbarium material in the Calcutta Herbarium the author is inclined to conclude "that *C. candicans* is only a form or at most only a variety of *C. madurensis*."—*Winfield Dudgeon.*

3172. DUNN, S. T. ET AL. Decades kewensis. Kew Bull. 1922: 117-122. 1922.—New species of plants from southern Asia are described. Those proposed by S. T. Dunn are: *Indigofera rubro-violacea*, India; *Tanacetum Kennedyi*, Tibet; and *Pulicaria insignis* J. R. Drummond, Tibet; other species, by J. S. GAMBLE, are: *Ligustrum travancoricum*, *Toxocarpus Beddomei*, *T. palghatensis*, *Brachystelma Bourneae*, and *B. Rangacharii*, all from southern India; those by H. H. HAINES are: *Stereospermum angustifolium* and *Premna calycina*, India.—*T. J. Fitzpatrick.*

3173. GUPTA, B. L. A note on the genus *Butea*. Jour. Indian Bot. Soc. 3: 233-234. 1923.—Generic descriptions of *Butea* have given the number of ovules as 2. The author's examination of a large amount of material shows 4-7 ovules in *B. frondosa* Roxb., with 4 as the usual number; 4 in *B. superba* Roxb.: and 2 in *B. minor* Ham., *B. pellita* Hook. f., and *B. parviflora* Roxb. On the basis of ovule number, and inflorescence and flower characters, he suggests placing *B. frondosa* and *B. superba* in section *Eubutea*, *B. minor* and *B. pellita* in section *Meizotropus*, and *B. parviflora* in section *Spatholobus*. "The only reasonable alternative seems to be to treat all three (sections) as separate genera."—*Winfield Dudgeon.*

3174. HUGHES, D. K. Further notes on the Australian species of *Stipa*. Kew Bull. 1922: 15-22. Fig. 1-4. 1922.—This article is based on the material in the U. S. National Herbarium. *Stipa bigeniculata* and *S. effusa* are proposed as new species.—*T. J. Fitzpatrick.*

3175. KILLIP, ELLSWORTH P. New species of *Urticaceae* from Colombia. Jour. Washington [D. C.] Acad. Sci. 13: 354-360. 1923.—The following species are described: *Pilea filicina*, *P. Hazeni*, *P. puracensis*, *P. ornatifolia*, *P. Pennellii*, *P. rhombifolia*, *P. purpurea*, *P. tatamensis*, *P. obetiaefolia*, *Boehmeria coriacea*, *B. arbuscula*, *Phenax grossecrenatus*.—*Helen M. Gilkey.*

3176. MACKENZIE, KENNETH K. Notes on *Carex*-XIII. Bull. Torrey Bot. Club 50: 343-358. 1923.—The identity of *C. Goodenowii* J. Gay and of *C. acuta* L. is established. *C. muricata* L., *C. bipartita* All., and *C. xanthocarpa* Bicknell are discussed. The following are published: *Kobresia simpliciuscula* (Wahlenb.) Mackenzie comb. nov., *Carex hirsutella* Mackenzie nom. nov., *C. plana* Mackenzie sp. nov., and *C. brachyglossa* Mackenzie nom. nov.—*P. A. Munz.*

3177. PETCH, T. A new *Sciaphila*. Jour. Indian Bot. Soc. 3: 226. 1923.—*Sciaphila inornata* n. sp., allied to *S. secundiflora* Thw., is described from the jungle at Hakgala, Ceylon, altitude 5,600 feet.—*Winfield Dudgeon.*

3178. PHILLIPS, E. P. ET AL. **Diagnoses africanæ: LXXVI.** Kew Bull. 1922: 193-198. 1922.—The following new species are delimited: *Xylothea Kotzei*, South Africa, Zululand; *Dialium Simii*, tropical Africa, Rhodesia; *Brunia albiflora*, South Africa, Caledon Division; *B. Stokoei*, South Africa, Caledon Division; all by Phillips. *Mimetes Stokoei*, South Africa, Caledon Division, by PHILLIPS and J. HUTCHINSON; *Rhinopteryx angustifolia*, tropical Africa, Gold Coast, by T. A. SPRAGUE. *Mussaenda Dawei*, tropical Africa, by HUTCHINSON. *Pteronia intermedia*, South Africa, by Hutchinson and Phillips. *Brachystelma floribundum*, tropical Africa, Rhodesia; and *B. lanceolatum*, tropical Africa, Uganda, both by W. T. TURRILL.—T. J. Fitzpatrick.

3179. PITTIER, H. **New or little known Melastomataceæ from Venezuela and Panama.** Jour. Washington [D. C.] Acad. Sci. 13: 384-392. 1923.—New species described are the following: *Chaetolepis sessilis*, *Tibouchina brachyanthera*, *Desmoscelis mollis*, *Monochaetum Jahni*, *Miconia rufostellulata*, *Clidemia gracilis*, *Ossaea trichocalyx*. Keys of the Venezuelan species of *Chaetolepis*, of *Monochaetum*, and of one section of *Tibouchina*, are added; also descriptions of 3 formerly little known species, as follows: *Monochaetum discolor* Karsten ex Triana, *Marcelia andicola* Naudin, and *Clidemia grandifolia* Cogn.—Helen M. Gilkey.

3180. REHDER, ALFRED. **Enumeration of the ligneous plants of northern China.** Jour. Arnold Arboretum 4: 117-192. 1923.—This is the 1st part comprising the families Ginkgoaceæ to Ranunculaceæ of an enumeration of the trees and shrubs known from the 6 northern provinces of China. Under each species and variety the literature referring to the occurrence of the plant in these provinces is cited and the specimens seen by the author enumerated. The general distribution of the species is given with occasional notes on critical plants. One new species and 1 new variety, *Salix cupularis* and *S. cupularis* var. *lasiogyne*, appear in the paper.—Alfred Rehder.

3181. REHDER, ALFRED. **New species, varieties and combinations from the herbarium and the collections of the Arnold Arboretum.** Jour. Arnold Arboretum 4: 246-253. 1923.—The author describes the hitherto unknown staminate flower of *Sinowilsonia Henryi*, the flowers of *Forsythia ovata* and of *Lonicera subsessilis*, and publishes the following new combinations, new names, and new hybrid: *Tilia platyphyllos* var. *rubra* (West.), *Helianthemum nummularium* var. *cupreum* f. *crocatum* (Sweet), var. *mutabilis* (Jacq.), var. *stramineum* (Sweet), var. *venustum* (Sweet), var. *diversifolium* (Sweet), var. *diversifolium* f. *rubro-plenum*, *Hedera nepalensis* var. *sinensis* (Tobl.), *Rhododendron carolinianum* var. *album* (Kelsey), and \times *Lonicera Purpusii*.—Alfred Rehder.

3182. RIDLEY, H. N. **Rigiolepis and other Vacciniaceæ of Borneo.** Kew Bull. 1922: 106-108. 1922.—The author describes and annotates the following species, all proposed as new: *Rigiolepis lancifolia*, *R. Lobbii*, *Vaccinium sulcatum*, and *V. monanthum*.—T. J. Fitzpatrick.

3183. ROGERS, R. S., AND C. T. WHITE. **Contributions to the orchidaceous flora of Queensland No. 1.** Proc. Roy. Soc. Queensland 32: 117-124. 2 fig. 1921.—Two new species, *Zeuxine oblonga* and *Z. attenuata*, and 1 new combination, *Acianthus amplexicaulis* (*Microstylis amplexicaulis* Bail.), are described and figured. New locality records for *Dipodium ensifolium* F. v. M., *Eulophia venosa* Reichb. f., and *Geodorum pictum* Lindl. are given.—W. D. Francis.

3184. ROGERS, R. S., AND C. T. WHITE. **Contributions to the orchidaceous flora of Queensland, No. 2.** Proc. Roy. Soc. Queensland 32: 135-143. 1921.—A revised account of the Queensland species of *Habenaria* with a key to the Australian members of the genus is given. Two new species are described, namely, *Habenaria divaricata* and *H. ovoidea*.—W. D. Francis.

3185. ROLFE, R. A. **New orchids: decas xlix.** Kew Bull. 1922: 22-26. 1922.—This paper represents the last contribution to the study of orchids by the late Mr. Rolfe. The following species are proposed as new: *Agrostophyllum seychellarum*, Seychelles Islands; *Catasetum Rothschildii*; *Microstylis Whitmeei*, Samoa; *Bulbophyllum scandens*, Seychelles Islands; *Microstylis Thomassetii*, Seychelles Islands; *Anoetochilus burmannicus*, Burma; *Maxillaria insignis*, Peru; *Camaridium vinosum*; *Cryptophoranthus Lehmannii*, Colombia; *Megaclinium angustum*, W. tropical Africa, Old Calabar.—T. J. Fitzpatrick.

3186. RYDBERG, P. A. A new genus of senecioid composites. Jour. Washington [D. C.] Acad. Sci. 13: 287-289. 1923.—The genus *Clappia* is shifted from the subtribe *Jaumieae* to *Tageteae*, the change being based upon the presence in *Clappia* of fimbriellae on the receptacle, and elongated black resin glands on the bracts of the involucre and on the leaves. For *Clappia suaedaefolia* of Wootton and Standley, reported in the Flora of New Mexico, the genus *Pseudoclappia* is proposed since the absence of fimbriellae and black resin glands excludes it from the genus *Clappia*. The species is described under the name *Pseudoclappia arenaria*.—Helen M. Gilkey.

3187. SCHNEIDER, CAMILLO. Notes on hybrid *Berberis* and some other garden forms. Jour. Arnold Arboretum 4: 193-232. 1923.—The author gives a critical account of the numerous hybrids and of some of the variations of *Berberis* originated under cultivation. Each form is fully described, the literature and synonyms cited and notes on its history given. The following hybrids, names, and combinations are new: *Berberis emarginata* Willd. var. *britannica*, *B. provincialis* Audibert var. *serrata*, *B. kewensis*, *B. hauniensis*, *B. macracantha* Schrad. var. *pulchra*, *B. Parsonsii*, *B. Spaethii*, *B. notabilis*, *B. bella*, *B. durobrivensis*, *B. declinata* Schrader var. *oxyphylla*, *B. laxiflora* Schrader vars. *oblanceolata* and *Langeana*, *B. Thunbergii* DC. f. *Maximowiczii* (Regel) and f. *argenteo-marginata*, *B. vulgaris* L. f. *Egbertii* (Hort.), *B. Vanfleetii*, *B. Vilmorinii*.—Alfred Rehder.

3188. SPRAGUE, T. A. *Pelargonium citriodorum*. Kew Bull. 1922: 155-156. 1922.—Two different forms have received the name *P. citriodorum*, both supposed to be hybrids. The 2nd form is here referred to *P. citrosum* Voigt. The synonymy of both forms is given.—T. J. Fitzpatrick.

3189. SPRAGUE, T. A., ET AL. *Decades Kewensis*. Kew Bull. 1922: 183-188. 1922.—The species described as new by T. A. Sprague are: *Vochysia hondurensis*, British Honduras; and *V. tabascanica*, Tabasco, Mexico; those by L. A. M. RILEY are: *Rhus costaricensis*, Costa Rica; and *Vaccinium glaucescens*, Mexico; by W. B. TURRILL, *Veronica rigida*, Greek Macedonia; *Beloperone flaviflora*, West Indies; and *Isothea alba*, West Indies, the genus *Isothea* (Acanthaceae-Justicieae) being delimited as new. Other new species are: *Acacia pseudo-eburnea*, northwest India, by J. R. Drumm.; *Clethra tomentella*, Philippine Islands, by R. A. ROLFE; and *Leucas helicterifolia*, India, by H. H. HAINES.—T. J. Fitzpatrick.

3190. STANDLEY, PAUL C. *Calderonia* and *Exandra*, two new genera of the family Rubiaceae. Jour. Washington [D. C.] Acad. Sci. 13: 289-293. 1923.—*Calderonia salvadorensis* and *Exandra rhodoclada* are described from material collected in Salvador and Mexico, respectively. The rediscovery of *Blepharidium guatemalense* Standl. is also noted.—Helen M. Gilkey.

3191. STANDLEY, PAUL C. New species of plants from Salvador. Jour. Washington [D. C.] Acad. Sci. 13: 363-369. 1923.—The following new species are described by Paul C. Standley, Agnes Chase, or Wm. Trelease, as indicated: *Pennisetum vulcanicum* Chase, *Lindmania flaccida* Standl., *Tillandsia vicentina* Standl., *Dioscorea salvadorensis* Standl., *Agave Calderoni* Trelease, *Peperomia izalcoana* Trelease, *P. matapalo* Trelease, *P. Standleyi* Trelease, *Piper patulum* var. *cordifolium* Trelease, *P. Standleyi* Trelease, *P. uncatum* Trelease, *P. uncatum* var. *Levyanum* Trelease, *Ficus Renssoniana* Calderón & Standl., *Aristolochia salvadorensis* Standl., *Coccoloba montana* Standl., *Pleurpetalum calospermum* Standl., *P. pleiogynum* (Kuntze) Standl. (*Celosia pleiogyna* Kuntze).—Helen M. Gilkey.

3192. STANDLEY, PAUL C. Ten new species of trees from Salvador. Jour. Washington [D. C.] Acad. Sci. 13: 350-354. 1923.—From specimens collected by the writer and by Salvador Calderón of the Salvadorean Dept. of Agriculture, the following new species are described: *Pseudolmedia mollis*, *Ledenbergia macrantha*, *Hyperbaena phanerophlebia*, *Rollinia Renssoniana*, *Inga Calderoni*, *Cupania mollis*, *Korwinskia Calderoni*, *Clethra vicentina*, *Clethra vulcanicola*, *Avicennia bicolor*.—Helen M. Gilkey.

3193. TURRILL, W. B. Notes on Cyperaceae. I. Kew Bull. 1922: 122-124. 1922.—A discussion is given of the synonymy of *Pycnus pumilus* (*Cyperus pumilus* L.) and *P. hyalinus* (C. *hyalinus* Vahl), both Indian species.—T. J. Fitzpatrick.

3194. WHITE, C. T. A contribution to our knowledge of the flora of Papua (British New Guinea). Proc. Roy. Soc. Queensland 34: 5-65. 1923.—The results of the examination of 800 plant specimens collected in 1918 by the author are recorded. The following new species

and varieties are described: *Rhipogonum papuanum*, *Riedelia Whitei* Ridl., *R. lanatiligulata* Ridl., *Eriolopha ovalifolia* Ridl., *Phacelophyrrhium Whitei* Ridl., *Grevillea subargentea*, *G. densiflora*, *Helicia validinervis*, *H. latifolia*, *Loranthus barbellatus* Blakely, *L. odontocalyx* F. v. M. var. *propria* Blakely, *Desmodium papuanum*, *Mucuna Stanleyi*, *Flemingia lineata* Roxb. var. *papua*, *Buchanania papua*, *Semecarpus undulata*, *Terminalia Okari*, *Uncaria Schlenckerae* S. Moore, *Mussaenda Whitei* S. Moore, *Timonius cryptophlebus* S. Moore, *Izora Whitei* S. Moore, *Psychotria decorifolia* S. Moore, *P. mafuluensis* S. Moore, and *P. Whitei*.—W. D. Francis.

3195. WHITE, C. T., AND W. D. FRANCIS. Contributions to the Queensland flora. Proc. Roy. Soc. Queensland 33: 152-165. 3 fig. 1921.—The following new species are described: *Cryptandra armata*, *Kunzea flavescens*, *Dentella minutissima*, *Symplocos Hayesii*, *Westringia parvifolia*, *W. tenuicaulis*, and *Endiandra crassiflora*. The Queensland species of *Westringia* are revised and notes on other Queensland plants are included.—W. D. Francis.

3196. WILDEMAN, É. DE. Additions a la flore du Congo II. [Additions to the flora of Congo.] Bull. Jard. Bot. État Bruxelles 5: 269-364, 365-412. 1919.—These pages continue, from pp. 117-268 of the present volume, the author's record of additions to the flora of Congo and include the enumeration of over 400 species and varieties of flowering plants from *Dalbergia* of the Leguminosae to *Alafia* of the Apocynaceae. *Grewia Claessensi* and *Alafia Vermeulenii* are described as new to science.—J. M. Greenman.

3197. WILDEMAN, É. DE. Additions a la flore du Congo. [Additions to the flora of Congo.] Bull. Jard. Bot. État Bruxelles 7: 1-88. 1920.—The present article lists upwards of 300 species and several varieties of flowering plants. The following species are new to science: *Cryptolepis Laurenti*, *Ceropegia Lujai*, and *C. sankuruensis*.—J. M. Greenman.

3198. WILDEMAN, É. DE. Contribution a l'étude les espèces Africaines du genre *Acioa* Aubl. [Contribution to the knowledge of the African species of *Acioa*.] Bull. Jard. Bot. État Bruxelles 7: 188-217. 1920.—The author presents a synoptical revision of, and a key to, the African species of *Acioa*, recognizing 35 species and several varieties. The following are new to science, De Wildeman being the author unless otherwise indicated: *Acioa Icondere* Baill. var. *Welwitschii*, *A. Klaineana* Pierre, *A. Unwini*, *A. hirsuta* A. Chev., *A. Reygaerti*, *A. Brazzai*, *A. Stapfiana*, *A. laevis* Pierre, *A. Tholloni*, *A. Lujai*, *A. cinerea* Engler, *A. Pierrei*, *A. Chevalieri* (*A. Icondere* A. Chev., not Baill.), *A. eketensis*, *A. Rudatisi*, and *A. dichotoma*.—J. M. Greenman.

3199. WILDEMAN, É. DE. Notes sur le genre *Rinorea* Aubl. [Notes on the genus *Rinorea* Aubl.] Bull. Jard. Bot. État Bruxelles 6: 131-194. 1920.—A discussion of the genus *Rinorea* Aubl. is presented, followed by an analytical key to the subgenera, sections, and subsections represented in Africa, then a key to the African species. The following new species, new names, and combinations are included: *Rinorea bondoensis* (*Alsodeia bondoensis* De Wild.), *R. Brandti*, (*R. monticola* Brandt, not Baill.), *R. Brieyi* (*A. Brieyi* De Wild.), *R. Claessensi* (*A. Claessensi* De Wild.), *R. crassifolia* (*A. crassifolia* Baker f.), *R. dubia* (*A. dubia* De Wild.), *R. Gilleti* (*A. Gilleti* De Wild.), *R. Giorgii* (*A. Giorgii* De Wild.), *R. Kerkhoveni* (*A. Kerkhoveni* De Wild.), *R. kionzoensis* (*A. kionzoensis* De Wild.), *R. Laurenti* (*A. Laurenti* De Wild.), *R. longifolia* (*A. longifolia* De Wild.), *R. Lujai* (*A. Lujai* De Wild.), *R. moandensis* (*A. moandensis* De Wild.), *R. obanensis* (*A. obanensis* Baker f.), *R. pallidiviridis* (*A. pallidiviridis* De Wild.) and var. *lembaensis*, *R. Sapini* (*A. Sapini* De Wild.), *R. seleensis* (*A. seleensis* De Wild.), *R. Sereti* (*A. Sereti* De Wild.), *R. subglandulosa* (*A. subglandulosa* De Wild.), *R. Talbotii* (*A. Talbotii* Baker f.), *R. variifolia* (*A. variifolia* De Wild.), and *R. Verschuereni* (*A. Verschuereni* De Wild.).—J. M. Greenman.

3200. WILDEMAN, É. DE. Notes sur quelques espèces Africaines du genre *Clerodendron* (Verbenaceae). [Notes on some African species of the genus *Clerodendron*.] Bull. Jard. Bot. État Bruxelles 7: 161-187. 1920.—Critical notes are recorded on several species and the following new species and varieties are described: *Clerodendron cauliflorum*, *C. Goossensi*, *C. hexagonum*, *C. laxicosum*, *C. macrocalyx*, *C. variifolium* and var. *scandens*, *C. attenuatum* (*C. myricoides* var. *attenuatum* De Wild.), *C. savorum*, *C. Bequaerti* and var. *Debeersti*.—J. M. Greenman.

3201. WILDEMAN, É. DE. Observations sur des Légumineuses de la flore Africaine. [Observations on the Leguminosae of the African flora.] Bull. Jard. Bot. État Bruxelles 7: 219-270. 1920.—Critical notes are recorded on several genera of Leguminosae; keys are given to the African species of *Ostryocarpus*, *Leptoderris*, *Hymenostegia*, *Cynometra*, *Oxystigma*, *Crudia*, *Daniellia*, and *Craibia*; and the following new species, varieties, and new names are included: *Leptoderris Claessensi* (*Derris Claessensi* De Wild.), *L. congolensis* (De Wild.) Dunn var. *quinquefoliolata*, *L. coriacea* (*D. coriacea* De Wild.), *L. cylindrica* (*D. cylindrica* De Wild.), *L. Dewevrei* (*D. Dewevrei* De Wild.), *L. ferruginea* (*D. ferruginea* De Wild.), *L. Gilleti* (*D. Gilleti* De Wild.), *L. Giorgii* (*D. Giorgii* De Wild.), *L. Klaineana* (*D. Klaineana* Pierre), *L. Laurenti* (*D. Laurenti* De Wild.), *L. Pynearti* (*D. Pynearti* De Wild.), *L. Reygaerti* (*D. Reygaerti* De Wild.), *Hymenostegia Gilleti*, *Oxystigma Mafuta*, *O. Morteihani*, *Crudia gabonensis* Pierre, *C. Klainei* Pierre, *C. Zenkeri* Harms, *Brachystegia Lujai*, *Albizzia obliquifoliolata*, *Entada Claessensi*, *Macrolobium Malchairi*, *M. Bonnivairi*, *Piptadenia Claessensi*, *Daniellia Klainei* (*Cyanothyrsus Klainei* Pierre), *D. Morteihani* (*C. Morteihani* De Wild.), *Dialium Klainei* Pierre, *D. Pierrei*, *D. Reygaerti*, *Craibea dubia* (*Lonchocarpus dubius* De Wild.), *C. Laurenti* (*L. Laurenti* De Wild.), *C. Lujai* and var. *longeacuminata*.—J. M. Greenman.

3202. WILSON, ERNEST H. The Hortensias, *Hydrangea macrophylla* DC. and *Hydrangea serrata* DC. Jour. Arnold Arboretum 4: 233-246. 1923.—The author describes all the spontaneous and cultivated forms of the Hortensias, reviving the oldest specific name for the Garden Hortensias, *Hydrangea macrophylla*. The synonymy of each form is given in full and critical and historical notes added. The following combinations and names are new: *Hydrangea macrophylla* DC. f. *otaksa* (Sieb. & Zucc.), f. *Veitchii*, f. *manschurica* (Koehne), f. *Domotoi* (Hort.), var. *normalis*, var. *normalis* f. *caerulea* (Hook.), f. *azisai* (Sieb.), f. *macrosepala* (Regel), f. *rosea* (Sieb. & Zucc.), f. *Mariesii* (Bean), f. *maculata* (Bl.), *H. serrata* DC. f. *acuminata* (Sieb. & Zucc.), f. *pubescens* (Franch. & Sav.), f. *rosalba* (Van Houtte), var. *stellata* (Sieb. & Zucc.).—Alfred Rehder.

3203. YUNCKER, T. G. Two new species of *Cuscuta* from Peru. Bull. Torrey Bot. Club 50: 277-278. 2 fig. 1923.—*Cuscuta lucidicarpa* and *C. rubella* are described as new species.—P. A. Munz.

REVISIONS AND MONOGRAPHS

3204. GÁYER, GYULA. Prodrömus der Brombeerenflora Ungarns. [Prodrömus of the Rubus flora of Hungary.] Magyar Bot. Lapok 20: 1-44. 1921.—A brief history of the study of the Hungarian species is given. About 800 names have been proposed. The need of more study is shown, as the principal authors are not in accord. The greatest difficulty comes from the polymorphism within the genus, caused in part by the many hybrid forms. A certain number of species types is recognized. The hybrids are distinguished by the names of the 2 supposed parents connected by the symbol X. Pure pollen is found only in the species types. A conspectus is given of the 59 species, and a key to the same including subspecies, forms, and hybrids, with synonymy and other notes. No new names are proposed.—K. M. Wiegand.

3205. HUGHES, D. K. The "serrato-ciliata" group of *Tropaeolum*. Kew Bull. 1922: 63-85. 4 pl. 1922.—A synoptical study of the group with keys and full descriptions is presented. The following species are proposed as new: *Tropaeolum Matthewsii*, Peru; *T. papillosum* and *T. adpressum*, Ecuador; *T. hirtifolium*, *T. Traceyae*, *T. Lehmannii*, *T. Dawei*, *T. tomentosum*, *T. parvifolium*, *T. pseudopubescens*, *T. coccineum*, *T. maculifolium*, *T. integrifolium*, *T. kerneisinum*, *T. pentagonum*, and *T. trilobum*, Colombia.—T. J. Fitzpatrick.

3206. MAIDEN, J. H. A critical revision of the genus *Eucalyptus*. Vol. VII. Part 1. P. 1-52, pl. 243-251. Alfred James Kent: Sydney, 1923.—Descriptions or critical notes are given of the following species: *Eucalyptus fastigiata* Deane & Maiden, *E. xanthoneura* Turcz., *E. Schlechteri* Diels, *E. apiculata* Baker & Smith, *E. Sieberiana* F. v. M., *E. virgata* Sieb., *E. acacioides* A. Cunn., *E. Naudiniana* F. v. M., *E. Caleyi* Maiden, *E. Baueriana* Schauer, *E. falcata* Turcz., *E. Spenceriana* Maiden, *E. radiata* Sieb., *E. numerosa* Maiden, *E. nitida* Hook. f., and *E. eremophila* Maiden var. *grandiflora* n. var. Chapters on the enemies of eucalyptus and on the inflorescence and the fruit are included. Important characters of the inflorescence, flower, and fruit are copiously illustrated.—J. M. Greenman.

3207. PIPER, C. V., AND S. T. DUNN. A revision of *Canavalia*. Kew Bull. 1922: 129-145. 1 fig. 1922.—Only the Old World species are considered in this article. The following species are proposed as new: *Canavalia regalis* Dunn, tropical Africa; *C. Africana* Dunn, tropical Africa; *C. podocarpa* Dunn, India; *C. ferruginea* Piper, tropical and south Africa; and *C. plagi-osperma* Piper, native of Cuba.—T. J. Fitzpatrick.

3208. RYDBERG, PER AXEL. Notes on *Fabaceae*-II. Bull. Torrey Bot. Club. 50: 261-272. 1923.—In the genus *Homalobus*, the groups *Campestres* and *Stenophylli* are treated. *Homalobus Coltoni* (M. E. Jones) comb. nov., *H. MacGregorii* sp. nov., *H. Antiselli* (Gray) comb. nov., *H. inversus* (M. E. Jones) comb. nov., and *H. gaviotus* (Elmer) comb. nov. are published.—P. A. Munz.

3209. SPRAGUE, T. A. A revision of *Amoreuxia*. Kew Bull. 1922: 97-105. 1 pl. 1922.—The author gives full descriptions with keys for the 7 known species. Two species are proposed as new and 1 new combination is made, as follows: *A. Gonzalezii* Sprague & Riley, Mexico; *A. colombiana*, Colombia; and *A. Schiedeana* (*Euryanthe Schiedeana* Cham. & Schlecht.), Mexico.—T. J. Fitzpatrick.

FLORISTICS AND PLANT DISTRIBUTION

3210. ANONYMOUS. Gambia plants. Kew Bull. 1922: 202-203. 1922.—A short note is given on "List of plants collected in the Gambia, by M. T. Dawe," published in 1922.—T. J. Fitzpatrick

3211. CLUTE, WILLARD N. Our native phloxes. Amer. Bot. 29: 137-138. 1923.—A statement of native American species and their distribution is given.—Susan P. Nichols.

3212. FITZPATRICK, T. J. The arborescent flora of midwest farmsteads. Amer. Bot. 29: 142-149. 1923.—A list of forms found in Buffalo County, Nebraska, is given.—Susan P. Nichols.

3213. FORBES, HELENA. Natal species of the genus *Cassia*. South African Jour. Sci. 18: 342-344. 1922.—Six species are described, namely *Cassia tomentosa* Lam. and *C. bicapsularis* L. introduced from tropical America; *C. delagoensis* Harv., *C. laevigata* Willd., *C. occidentalis* L., and *C. mimosoides* L.—E. M. Doidge.

3214. HUTCHINSON, J. The genus *Heywoodia*. Kew Bull. 1922: 114-116. 1 pl. 1922.—This genus, of the family Euphorbiaceae, and its species, *H. lucens* Sim, of South Africa, are recharacterized and fully annotated from abundant material recently acquired.—T. J. Fitzpatrick.

3215. PETCH, T. *Caesal pinia Bonducella Fleming*. Jour. Indian Bot. Soc. 3: 223-225. 1923.—Specimens collected by Hermann in the 17th century formed the only authentic record of the occurrence of this plant in Ceylon. It was rediscovered in 1922.—Winfield Dudgeon.

3216. THODAY, D. The genus *Passerina* and its distribution in South Africa. [Abstract.] South African Jour. Sci. 18: 230-231. 1922.—Thirteen forms of this genus have been recognized in South Africa, but names cannot be assigned with certainty until it has been possible to examine the material in the European herbaria. So far the data suggest that habitat is a factor of prime importance in the distribution of the species.—E. M. Doidge.

3217. WHITE, C. T. Weeds of Queensland No. 29. Queensland Agric. Jour. 19: 81. Pl. 28. 1923.—A description of the Peach-leaf Poison Bush (*Trema aspera* Blume) is given and its distribution outlined. Its occasional toxicity, owing to the occasional presence in the leaves of a cyanogenetic glucoside, is referred to.—W. D. Francis.

3218. WHITE, C. T. Weeds of Queensland, No. 30. Queensland Agric. Jour. 19: 238-239. Pl. 53. 1923.—A short description of *Solanum Seaforthianum* Andr. is given and its distribution in Queensland and place of origin outlined. The suspected poisonous properties of the plant are referred to.—W. D. Francis.

3219. WHITE, C. T. Weeds of Queensland, No. 31. Queensland Agric. Jour. 19: 286. Pl. 57. 1923.—A short botanical description of *Cryptostegia grandiflora* R. Br. is given and its distribution, place of origin, and properties outlined.—W. D. Francis.

3220. WHITE, C. T. Weeds of Queensland, No. 32. Queensland Agric. Jour. 19: 516. Pl. 113. 1923.—*Cleome aculeata* L. is described and its distribution outlined.—W. D. Francis.

3221. WHITE, C. T. Weeds of Queensland, No. 33. Queensland Agric. Jour. 20: 49. Pl. 4. 1923.—*Baccharis halimifolia* L. is described and illustrated; its place of origin outlined; and its supposed poisonous properties referred to. Feeding experiments with guinea pigs show that the plant is not definitely poisonous but is quite valueless as a fodder.—W. D. Francis.

3222. WHITE, C. T. Weeds of Queensland, No. 34. Queensland Agric. Jour. 20: 236. Pl. 61. 1923.—*Crotalaria striata* is described and its distribution and economic uses outlined. On the authority of J. C. Lewis, who conducted feeding experiments with goats in the Northern Territory, the plant is definitely poisonous; he found that 2-3 ounces of fresh leaves in bolus form were sufficient to kill goats within 24 hours.—W. D. Francis.

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

S. F. TRELEASE, *Editor*

3223. ANONYMOUS. Note. Nature 112: 519. 1923.—This notes the start of the first paper mill for production of print paper from water plants (*Typha*, *Phragmites*, etc.) in Saxony. It is estimated that one million tons of such material can be obtained in Germany.—O. A. Stevens.

3224. ANONYMOUS. Science and publicity. Nature 112: 381-383. 1923.—It is hardly to be expected and perhaps not desirable that an investigator should be able to write for the general public, but popular articles are very desirable. The writer refers to "Science Service" and the bulletins of the National Research Council in the U. S. A., and feels that in the British Isles not so much progress has been made. The British Association welcomes membership from the general public and attempts to arouse public interest in the locality where its meetings are held, but further work in popular exposition of its addresses is desirable.—O. A. Stevens.

3225. AZOULAY, L. De l'utilité des rapports annuels sur les marchés aux champignons pour le progrès de la mycologie. [Utility of annual reports of mushroom markets for the progress of mycology.] Bull. Trimest. Soc. Mycol. France 39: 77-78. 1923.—The writer gives an account of the control of mushrooms in several cities of France and Switzerland. He recommends annual reports concerning the species coming into the market.—S. Blumer.

3226. BENGTTSSON, N. Die Einwirkung des Babassufutters auf Butter- und Schweinfett. [Influence of babassu feeding on fats of butter and swine.] Zeitschr. Untersuch. Nahrungs-u. Genussmittel 44: 336-339. 1922.—Babassu is the seed of the South American palm *Orbignya Lydia* Dr. Fat of swine fed upon it showed constants within the normal, but butter fat showed variations in the Reichert-Meisel number and Polenske number which would ordinarily lead to suspicion of adulteration with vegetable fat.—E. E. Stanford.

3227. GOODACRE, W. A. To prevent crystallization when bottling honey. Agric. Gaz. New South Wales 34: 721. 1923.

3228. MOREL. L'inspection des champignons dans la ville de Sainte-Etienne. [Inspection of edible fungi in Sainte-Etienne.] Bull. Trimest. Soc. Mycol. France 39: 79-83. 1923.—This paper contains an historical review of the food-policy of Sainte-Etienne and the list of the edible fungi in the regulations of 1897, 1912, and 1921. Some notes are given on the control of edible mushrooms, quantities, prices, and falsifications.—S. Blumer.

